S. Hrg. 99-258

WATER RESOURCE LEGISLATION

HEARING

BEFORE THE

SUBCOMMITTEE ON WATER AND POWER

OF THE

COMMITTEE ON
ENERGY AND NATURAL RESOURCES
UNITED STATES SENATE

NINETY-NINTH CONGRESS

FIRST SESSION

ON

S. 1131

A BILL TO AUTHORIZE THE SECRETARY OF THE INTERIOR TO INTEGRATE THE HILLTOP AND GRAY GOOSE UNITS INTO THE PICK-SLOAN MISSOURI BASIN PROGRAM, SOUTH DAKOTA

S. 1157

A BILL TO AUTHORIZE THE SECRETARY OF THE INTERIOR TO PERFORM STUDIES RELATING TO DISPOSAL OF DRAIN WATER AND TO CONSTRUCT INTERIM CORRECTIVE MEASURES DEEMED NECESSARY FOR THE SAN LUIS INTERCEPTOR DRAIN

S. 1171

A BILL TO AMEND THE SMALL RECLAMATION PROJECTS ACT OF 1956, AS AMENDED

S. 1192

A BILL TO IMPLEMENT THE COORDINATED OPERATION AGREEMENT

JULY 16, 1985

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WATER RESOURCE LEGISLATION

TUESDAY JULY 16, 1985

U.S. SENATE,
SUBCOMMITTEE ON WATER AND POWER,
COMMITTEE ON ENERGY AND NATURAL RESOURCES,
Washington, DC.

The subcommittee met, pursuant to notice, at 2:12 p.m., in room SD-366, Dirksen Office Building, Hon. Frank H. Murkowski presiding.

Present: Senators Murkowski and Hecht.

Also present: Russell R. Brown, professional staff member; and William Conway, counsel for the minority.

OPENING STATEMENT OF HON. FRANK H. MURKOWSKI, A U.S. SENATOR FROM THE STATE OF ALASKA

Senator MURKOWSKI. We will call the hearing to order.

The hearing this afternoon before the Senate Subcommittee on Water and Power of the full Committee of Energy and Natural Resources is to take testimony on four bills. The first, S. 1131, introduced by Senator Abdnor and Senator Pressler, would incorporate the existing Hilltop and Gray Goose irrigation projects as units of the Pick-Sloan Missouri Basic Program in South Dakota.

S. 1157, introduced by Senator Jim McClure on behalf of the administration would authorize funding for studies and corrective measures related to the disposal of agricultural drainage waters in the San Luis drain area of the Central Valley Project in California.

The third, S. 1171, introduced also by Senator McClure and cosponsored by eight other Senators, would increase the authorization ceiling for the Small Reclamation Project Act of 1956.

And S. 1192, introduced by Senator Wilson and Senator Cranston, would implement the coordinated operation agreement between the Secretary of the Interior and the State of California for the Central Valley Project and the State Water Project.

I would ask that copies of the bills and related legislative reports be inserted in the record at this point.

[The texts of S. 1131, S. 1157, S. 1171, and S. 1192 follow:]

II

99TH CONGRESS
1ST SESSION

S. 1131

To authorize the Secretary of the Interior to integrate the Hilltop and Gray Goose Units into the Pick-Sloan Missouri Basin Program, South Dakota.

IN THE SENATE OF THE UNITED STATES

MAY 14 (legislative day, APRIL 15), 1985

Mr. ABDNOR (for himself and Mr. PRESSLER) introduced the following bill; which was read twice and referred to the Committee on Energy and Natural Resources

---

A BILL

To authorize the Secretary of the Interior to integrate the Hilltop and Gray Goose Units into the Pick-Sloan Missouri Basin Program, South Dakota.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the existing irrigation projects known as the Hilltop Irrigation District, Brule County, South Dakota, and the Gray Goose Irrigation District, Hughes County, South Dakota, are authorized as units of the Pick-Sloan Missouri Basin Program. As so authorized, the Hilltop Unit and the Gray Goose Unit shall be integrated physically and financially with the other Federal works constructed under the comprehensive plan approved by section 9 of the Flood Control

Act of December 22, 1944 (58 Stat. 887, 891), as amended and supplemented, and subject to Federal reclamation law (Act of June 17, 1902, 32 Stat. 388 and Acts amendatory thereof and supplemental thereto).

SEC. 2. Pick-Sloan Missouri Basin Program power shall be made available as soon as practicable for the Hilltop Unit and the Gray Goose Unit on the same basis as for other units of the Pick-Sloan Missouri Basin Program. The suballocated costs of the Pick-Sloan Missouri Basin Program assigned to the Hilltop Unit and the Gray Goose Unit shall be reimbursed by the water users as determined by the Secretary of the Interior in accordance with Federal reclamation law (Act of June 17, 1902, 32 Stat. 388 and Acts amendatory thereof and supplemental thereto.)

II

99TH CONGRESS
1ST SESSION

S. 1157

To authorize the Secretary of the Interior to perform studies relating to disposal of drain water and to construct interim corrective measures deemed necessary for the San Luis interceptor drain.

IN THE SENATE OF THE UNITED STATES

MAY 16 (legislative day, APRIL 15), 1985

Mr. MCCLURE (by request) introduced the following bill; which was read twice and referred to the Committee on Energy and Natural Resources

---

A BILL

To authorize the Secretary of the Interior to perform studies relating to disposal of drain water and to construct interim corrective measures deemed necessary for the San Luis interceptor drain.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. That there is authorized to be appropriated to the Secretary of the Interior for studies and interim corrective measures relating to distribution and drainage and to the disposal of drainage water in the west side of San Joaquin Valley of the Central Valley Project up to $12,600,000 for fiscal year 1986.

Sec. 2. The Secretary shall use his best efforts to obtain repayment contracts pursuant to section 9(d) of the Reclamation Project Act of August 4, 1939 (53 Stat. 1195) with respect to the expenditure of any funds authorized to be appropriated by this Act, said contracts to be with those water districts which benefit from such expenditure and to provide for the repayment of such funds within a period, not to exceed fifty years, determined by the Secretary. Any funds expended which are not made the subject of a repayment contract within two years of expenditure shall be added to the costs of the construction of works of the San Luis Unit, Central Valley Project, California or the Central Valley Project as a whole allocated to irrigation and shall be repaid pursuant to section 9(e) of the 1939 Act.

Sec. 3. The Secretary is authorized to receive additional funds from non-Federal entities to assist in the studies and/or construction authorized pursuant to this Act.

II

99TH CONGRESS
1ST SESSION

S. 1171

To amend the Small Reclamation Projects Act of 1956, as amended.

IN THE SENATE OF THE UNITED STATES

MAY 20 (legislative day, APRIL 15), 1985

Mr. MCCLURE (for himself, Mr. WILSON, Mr. CRANSTON, Mr. DECONCINI, and Mr. ABDNOR) introduced the following bill; which was read twice and referred to the Committee on Energy and Natural Resources

---

A BILL

To amend the Small Reclamation Projects Act of 1956, as amended.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That Public Law 84–984 is amended as follows: In section 10, in the first sentence after "$600,000,000" insert "and, effective October 1, 1986, not to exceed an additional $600,000,000".

II

99TH CONGRESS
1ST SESSION

S. 1192

To implement the Coordinated Operation Agreement.

IN THE SENATE OF THE UNITED STATES

MAY 22 (legislative day, APRIL 15), 1985

Mr. WILSON (for himself and Mr. CRANSTON) introduced the following bill; which was read twice and referred to the Committee on Energy and Natural Resources

---

A BILL

To implement the Coordinated Operation Agreement.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Secretary of the Interior is hereby authorized and directed to execute and implement the "Agreement Between the United States of America and the Department of Water Resources of the State of California for Coordinated Operation of the Central Valley Project and the State Water Project" (dated May 8, 1985).

Senator MURKOWSKI. In deference to our witnesses who have joined us today, I intend to keep my remarks short, with the exception of one more paragraph.

The four bills before the subcommittee today reflect the future of the Bureau of Reclamation's programs in the Western States and also the maturity of the reclamation effort. The two bills, S. 1157 and S. 1192, address the problems associated with existing projects and how we can take these projects and make them work better. S. 1171 also addresses the needs of an ongoing water resource program. Based on the testimony that was presented last fall before this subcommittee on similar legislation, S. 1171 will likely serve as a vehicle for updating the program to meet current concerns.

And finally, S. 1131 would allocate the resources of an existing water resource development to meet current needs.

In light of the relatively short notice preceeding this hearing, the record will remain open for 2 weeks for submission of written material.

We have a number of distinguished witnesses this afternoon. I think what we have done to Governor Janklow, is to subject him to a day in Washington, similar in respect to a day that I spent in Pierre conducting a rather extensive hearing with Russ Brown. The only difference is I think we have an air conditioning system here, and that the gymnasium in Pierre was divided by two heated groups, one on each side of the gymnasium, each with some very definite ideas and opinions as to the course of action that should be taken.

I understand the Governor has flown most of the night, but he's not going to get any sympathy from me because that happens to me all the time when I go back and forth to Alaska.

It is nice to see you alive and well, Governor, and we wish you welcome to Washington, DC. and hope that you get a good night's sleep here tonight, or at least, some fresh air, and I welcome your statement.

The first witness, Senator Cranston, is not here, so I assume we move down to Senator Pressler, who is second, and Senator Abdnor, who is third; Senator Wilson is next. I don't believe Senator Wilson's here. And we have the Governor next.

And Governor, I guess that's the seniority system in Washington at work which puts you down not too far from the top, but not too far from the bottom. [General laughter.]

Senator MURKOWSKI. You are right in the middle.

It is a pleasure to welcome you here. I hope that I have an opportunity this fall to pursue some hearings out in your area. I am told by Mr. Brown that it is going to be during pheasant season, but he's been promising me that for some time, and it never works out.

But with that casual observation, I would request that you proceed in order.

Senator Pressler.

STATEMENT OF HON. LARRY PRESSLER, A U.S. SENATOR FROM THE STATE OF SOUTH DAKOTA

Senator **Pressler**. Mr. Chairman, I shall be very brief because we have a vote on the Senate floor, and I ask unanimous consent to place my statement, my full statement, in the record.

Senator **Murkowski**. Without objection, your full statement will be placed in the record.

Senator **Pressler**. I would like to briefly say that the need for water development in South Dakota is clearly demonstrated this year. Much of my State is suffering through one of the most severe droughts in many decades. The drought has reduced the amount of hay and grain that is available in the areas.

The small irrigation projects such as the Hilltop and Gray Goose units are an important source of feed in the area during the drought years. the Hilltop and Gray Goose irrigation projects were constructed in the late 1970's from financing from the Farmers Home Administration. These two relatively small irrigation projects irrigate farmland along the Missouri River near Chamberlain and Pierre in South Dakota. Eighteen South Dakota family farmers are members of the two irrigation districts and benefit from the project.

However, in recent years the rising power costs have placed a greater burden on these family farmers. The power costs are now threatening the continued operation of the project. To aid the irrigation districts by reducing the power costs last year, the South Dakota congressional delegation introduced legislation to provide the two projects with low cost Pick-Sloan Missouri River Project pumping power. The Senate adopted this legislation as an amendment last year, but unfortunately it was deleted in a House-Senate Conference Committee.

Once again this year we've introduced legislation to incorporate these two projects into the Pick-Sloan Program. Doing so would reduce the power costs and allow these farmers to continue to benefit from irrigation.

I would also like once again to remind the committee of the commitment which the Federal Government made to South Dakota when the four main stream dams were constructed on the Missouri River in South Dakota. South Dakota sacrificed prime farmland in return for a promise of water development. To date, the water development promise has gone largely unfulfilled.

The authorization of low cost power for the Hilltop and Gray Goose irrigation projects would only be a small repayment for the losses South Dakota incurred to benefit downstream States.

Mr. Chairman, I ask unanimous consent to place the rest of my statement in the record.

[The prepared statement of Senator Pressler follows:]

TESTIMONY OF SENATOR LARRY PRESSLER
before the
SUBCOMMITTEE ON WATER AND POWER
of the
SENATE COMMITTEE ON ENERGY AND NATURAL RESOURCES
on
S. 1131
July 16, 1985

I WOULD FIRST LIKE TO COMMEND YOU FOR HOLDING THESE TIMELY HEARINGS AND FOR ALLOWING ME TO EXPRESS MY SUPPORT FOR A BILL WHICH I HAVE COSPONSORED WITH THE OTHER MEMBERS OF THE SOUTH DAKOTA CONGRESSIONAL DELEGATION. I ALSO WANT TO THANK YOU FOR ALLOWING THE OTHER SOUTH DAKOTA WITNESSES TO TESTIFY.

THE NEED FOR WATER DEVELOPMENT IN SOUTH DAKOTA IS CLEARLY DEMONSTRATED THIS YEAR. MUCH OF SOUTH DAKOTA IS SUFFERING THROUGH ONE OF THE MOST SEVERE DROUGHTS IN MANY DECADES. THE DROUGHT HAS REDUCED THE AMOUNT OF HAY AND GRAIN THAT IS AVAILABLE IN THE AREAS. THE SMALL IRRIGATION PROJECTS SUCH AS THE HILLTOP AND GRAY GOOSE UNITS ARE AN IMPORTANT SOURCE OF FEED IN THE AREA DURING THE DROUGHT YEARS.

THE HILLTOP AND GRAY GOOSE IRRIGATION PROJECTS WERE CONSTRUCTED IN THE LATE 1970S WITH FINANCING FROM THE FARMERS HOME ADMINISTRATION. THESE TWO RELATIVELY SMALL IRRIGATION PROJECTS IRRIGATE FARMLAND ALONG THE MISSOURI RIVER NEAR CHAMBERLAIN AND PIERRE IN SOUTH DAKOTA. EIGHTEEN SOUTH DAKOTA FAMILY FARMERS ARE MEMBERS OF THE TWO IRRIGATION DISTRICTS AND BENEFIT FROM THE PROJECT. HOWEVER, IN RECENT YEARS THE RISING POWER COSTS HAVE PLACED A GREATER BURDEN ON THESE FAMILY FARMERS. THE POWER COSTS ARE NOW THREATENING THE CONTINUED OPERATION OF THE PROJECT.

TO AID THE IRRIGATION DISTRICTS BY REDUCING THE POWER COSTS LAST YEAR, THE SOUTH DAKOTA CONGRESSIONAL DELEGATION INTRODUCED LEGISLATION TO PROVIDE THE TWO PROJECTS WITH LOW-COST PICK-SLOAN MISSOURI RIVER PROJECT PUMPING POWER. THE SENATE ADOPTED THIS LEGISLATION AS AN AMENDMENT LAST YEAR; BUT, UNFORTUNATELY, IT WAS DELETED IN A HOUSE-SENATE CONFERENCE COMMITTEE. ONCE AGAIN THIS YEAR, WE HAVE INTRODUCED LEGISLATION TO INCORPORATE THESE TWO PROJECTS INTO THE PICK-SLOAN PROGRAM. DOING SO WOULD REDUCE THE POWER COSTS AND ALLOW THESE FARMERS TO CONTINUE TO BENEFIT FROM IRRIGATION.

I WOULD ALSO LIKE TO ONCE AGAIN REMIND THE COMMITTEE OF THE COMMITMENT WHICH THE FEDERAL GOVERNMENT MADE TO SOUTH DAKOTA WHEN THE FOUR MAINSTEM DAMS WERE CONSTRUCTED ON THE MISSOURI RIVER IN SOUTH DAKOTA. SOUTH DAKOTA SACRIFICED PRIME FARMLAND IN RETURN FOR A PROMISE OF WATER DEVELOPMENT. TO DATE, THE WATER DEVELOPMENT PROMISE HAS GONE LARGELY UNFULFILLED. THE AUTHORIZATION OF LOW-COST POWER FOR THE HILLTOP AND GRAY GOOSE IRRIGATION PROJECTS WOULD ONLY BE A SMALL REPAYMENT FOR THE LOSSES SOUTH DAKOTA INCURRED TO BENEFIT DOWNSTREAM STATES.

THE REPRESENTATIVES OF THE IRRIGATION PROJECTS WILL GIVE YOU A GREAT DEAL MORE SPECIFICS ON THE PROJECTS. I JUST WANT TO URGE THE COMMITTEE TO TAKE FAVORABLE ACTION ON THIS LEGISLATION AS EARLY AS POSSIBLE. THANK YOU AGAIN FOR HOLDING THESE HEARINGS AND FOR ALLOWING ME TO TESTIFY.

Senator **MURKOWSKI**. Thank you very much.

Senator Abdnor.

Senator Cranston, would you care to join us at the table?

Senator **CRANSTON**. I would like to testify very briefly before the roll call, if I can.

Senator **MURKOWSKI**. I've got the same problem here.

STATEMENT OF HON. JAMES ABDNOR, A U.S. SENATOR FROM THE STATE OF SOUTH DAKOTA

Senator **ABDNOR**. Well, let me say, Mr. Chairman, that I greatly appreciate your action in convening this hearing today. It's one I've been anxiously waiting for, and I also want to add a special thanks to Mr. Cranston, Senator Cranston. I guess we jumped in ahead of him here, but I'm due over at a committee hearing where we are marking up the big water policy bill, and they had to hold up the committee for me to take the lead-off on it. So I do appreciate it.

Mr. Chairman, your hard work and your commitment greatly enhance the prospect for future development of all reclamation projects, and I want to applaud your efforts. The Hilltop and the Gray Goose Irrigation Projects are important not only to the irrigators themselves, but also to the local communities they help to support.

Irrigation is vitally important to the stability of South Dakota's economy. With those facts in mind, I introduced S. 1131 along with Senator Pressler to integrate the projects into the Pick-Sloan Missouri Basin Program. Senator Pressler, Congressman Daschle, Governor Janklow and I stand united in support of these irrigation districts and the need for the Federal Government to honor its 1944 commitment to South Dakotans.

The people of Montana, North Dakota and South Dakota lost 2 million acres of land when the main stem dams were placed in our States. These main stem dams protect our downstream neighbors from the flooding problems they once experienced. It required a great economic sacrifice on the part of our States to provide the flood protection. In return, we were to have received certain benefits, and they have not been realized.

Under the Pick-Sloan Missouri Basin Program, South Dakotans were to have received 170 megawatts of low cost power for irrigation purposes. To date we have received only 3 megawatts of the power owed to us.

We can start today with the Hilltop and Gray Goose Irrigation Projects. These two projects are a mere drop in the bucket when compared to the extensive, long overdue obligations due to the people of South Dakota. These two districts irrigate 5000 acres in the central portion of South Dakota, and due to the increase in energy costs, which has been over 300 percent since 1987, the projects are facing financially difficult times.

While their loans will remain under the Farmers Home Administration, the proposed legislation would do the following: one, provide Pick-Sloan power to the district; two, integrate the project into the reclamation program where the irrigation districts would be responsible for the suballocated costs; and three, retain the financial integrity of the projects and the current Federal investment in them.

The Hilltop and the Gray Goose legislation will not, and I repeat, will not require any new Federal expenditures. Other projects in the past have been integrated into the reclamation program. Let me give you an example. The Omaha Irrigation District Project in Nebraska initially was not a Bureau of Reclamation project but was authorized under Public Law 97-273 to receive low cost power. There are other instances where an irrigation project was started under either a private interest or another Federal agency but was integrated into the reclamation program at a later point in time.

The Hilltop and the Gray Goose projects do not in any way set a new precedent in water development. This process will continue to be a means to integrate projects into the reclamation program and for South Dakotans to realize a portion of the benefits that were promised to them.

An illustration of those benefits——

Senator MURKOWSKI. Senator, we are going to have to make a decision. We've got about 2 minutes left on a roll call, and I'd be happy to recess briefly till we could vote, if you want to do that. Senator Cranston is also in the same position, and I'm in the same position because I don't want to miss the vote.

Senator ABDNOR. I don't want you to, Mr. Chairman.

Senator MURKOWSKI. I would leave the call to you, but any way you want it.

Senator ABDNOR. Let's go and we'll be right back.

Senator MURKOWSKI. We'll recess the hearing, Senator, unless you have just a statement for submission in the record. I would be glad to accommodate you, but you know where we're at.

STATEMENT OF HON. ALAN CRANSTON, A U.S. SENATOR FROM THE STATE OF CALIFORNIA

Senator CRANSTON. I think because I have to do other things, I would like to say that I would like my full statement to appear in the record. I would comment on S. 1157, support S. 1171 and S. 1192.

The Kesterson problem, the drainage problem is immense. They don't seem to have answers in the Interior Department or elsewhere, and what is needed is oversight by this committee, and I plead with you to watch over that very, very carefully.

[The prepared statement of Senator Cranston follows:]

STATEMENT BY SENATOR ALAN CRANSTON
BEFORE THE SENATE ENERGY AND NATURAL RESOURCES COMMITTEE
SUBCOMMITTEE ON WATER AND POWER
REGARDING S. 1157, S. 1171, AND S. 1192

July 16, 1985

Mr. Chairman, I'm pleased to appear before the Water and Power Subcommittee of the Senate Energy and Natural Resources Committee this afternoon to offer comments on S. 1157, a bill to authorize the Secretary of Interior to perform studies relating to the disposal of agricultural drainage water and to construct interim corrective measures for the San Luis interceptor drain. I'm also here to support S. 1171, a bill to amend the Small Reclamation Projects Act, and S. 1192, a bill to implement the Coordinated Operating Agreement. I'm a cosponsor of both bills.

Mr. Chairman, addressing the agricultural drainage problem is plainly the most pressing water issue in the State of California today. A total of some 250,000 acres in the Central Valley Project service area is now affected by drainage problems. And the land needing drainage is expected to increase to about 380,000 acres by the year 2020. The present disposal of drainage water at Kesterson Reservoir, where selenium has poisoned waterfowl, is totally unacceptable. And as we all know, the Secretary of Interior has ordered halting deliveries to Kesterson by June 30, 1986, and will take action by February 5, 1988, to clean up Kesterson Reservoir as directed by the State Water Resources Control Board.

The legislation under consideration today authorizes $12.6 million for studies and interim corrective measures. This is for FY 1986 only, with the total study program currently estimated to cost $42 million and to take four to five years to complete. The Interior Department says it will use the money to put together the data needed to evaluate alternative solutions to the drainage problem. This is critical because the problem will not go away even if we shut down Kesterson. It's my understanding that the US Geological Survey is to determine the distribution and concentration of selenium and its impact on existing or proposed discharge areas, that the Fish and Wildlife Service is to study the bioaccumulation of selenium and its toxicity to wildlife, and that the Bureau of Reclamation is to determine what all this means for disposal of drain water.

The testimony of Assistant Secretary Robert N. Broadbent before the House Subcommittee on Water and Power Resources June 4 and the Bureau of Reclamation's background paper on the inter-agency drainage study program describe general areas of concern but no specific details.

Perhaps that's all that we can expect at this stage--generalities and laudable goals. That being the case, however, it's difficult to evaluate what the Department is proposing to do. Worse yet, it's difficult to judge whether the Department will be spending its money wisely and well.

We need a lot more information, a lot more detail, a lot more direction on how much money is going to be spent and on what. What this suggests to me, Mr. Chairman, is the need to keep close oversight as work progresses.

For example, the discovery of high levels of selenium at Kesterson certainly should have put an end to the possibility that the drainage water would ever be disposed of in the San Francisco Bay, the Delta, or Monterey Bay, yet some of USGS studies are to look at potential discharges into these bodies of water.

Additionally, S. 1157 calls for a $12.6 million authorization. But Assistant Secretary Broadbent, appearing before the House subcommittee, said the Department needs $12.4. Then the FY 1986 budget request called for $12,490,000. This is a small discrepancy, perhaps, but a disturbing one.

I understand the $12.6 million figure includes $200,000 for a study of asbestos which has gotten into the San Luis Canal from Arroyo-Passajero Creek. The Bureau says this work will be undertaken even if the authorization is reduced to $12.4 million. This points up the uncertainty in the authorization request.

I've previously called for the establishment of a Presidential Commission of outside scientists and other experts to recommend a solution to the overall problem of how to dispose of agricultural drainage water, not just in the federal project area but in the state service areas as well. I'm pleased that the Administration has agreed with me on the need to bring in non-government scientists and has asked the National Academy of Sciences to review the overall work program. In fact, it's my understanding that the Administration plans to submit another authorization and appropriation request commensurate with the final study plan following Academy review. This should give us a good opportunity to evaluate the Department's study program.

Mr. Chairman, we need to develop a long term solution to the agricultural wastewater problem. Without question the more basic research that is done, the better informed we will be in making a decision. This is a pressing matter and there will always be more to learn. I urge the Committee in authorizing FY 1986 funds for Interior studies on agricultural drainage water to be sure that money is spent wisely in addressing this urgent and critical problem.

Now, Mr. Chairman, I would like to turn my attention to S. 1171. This bill, as you know, increases the authorization of the Small Reclamation Projects Act of 1956 by $600 million. Earlier this year, we hit the ceiling contained in the original act, assuming Congress funds all previously approved projects. Thus, an increase is necessary if the program is to be continued.

Since 1956, the Small Reclamation Projects program has provided loans and grants for the construction of new or the rehabilitation of existing single purpose irrigation draingae or multipurpose water resources projects similar to those constructed by the Bureau of Reclamation. Costs allocated to municipal and industrial water supply, hydroelectric power and the loan portion of the costs allocated to fish and wildlife enhancement and recreation must be repaid with interest. The current interest rate is 10 7/8 percent. Costs allocated to irrigation, except for lands which are in excess of the acreage limitations of federal reclamation law, are non interest bearing consistent with other Bureau of Reclamation programs.

It should be noted that all loan funds are fully repaid to the U.S. Treasury. There has never been a default on any loan made under the program.

In addition to full repayment with interest, the program has provided for upfront cost sharing. While the percentage of cost sharing is not fixed in law, since 1974 the non-federal contribution has averaged 20 percent.

The maximum allowable loan cannot exceed two-thirds the total project cost. The total cost ceiling is fixed at $15 million based on January 1971 prices and indexed for inflation. Thus, for 1985 the ceiling is $41 million with the maximum loan at $27 million.

Mr. Chairman, this program has been highly successful in California and has proven an invaluable tool for the conservation and wise use of limited water resources. Twenty-four irrigation and water districts in California have benefitted from the program with completed projects. Nine more projects in my state are under construction or awaiting initial funding in the FY 1986 appropriations bill. But the need continues as evidenced by the fact that five more applications are under consideration at the Bureau and twelve more California districts have filed notices of intent to submit applications if there are available funds.

I look forward to working with this Committee to see that S. 1171 comes to the Senate floor this year.

I'm also pleased to support S. 1192, which Senator Pete Wilson and I have introduced to authorize the Secretary of the Interior to execute an agreement with the California Department of Natural Resources for coordinating the operations of the federal Central Valley Project and the State Water Project. This agreement which has been the subject of negotiations for many months is an important step for Californians as we seek to protect one of our most important resource areas, the Sacramento-San Joaquin Delta, while insuring the viability of these two great water projects which serve close to 20 million people and millions of acres of farm land.

By agreeing to their respective responsibilities for meeting the needs of the Delta as established through water quality standards as determined by the State Water Resources Control Board under the federal Clean Water Act and state water quality laws, both the state and the federal government now have the opportunity to move forward with programs to meet water supply needs. The Coordinated Operating Agreement includes provisions for the state to wheel federal water for federal customers and provides a mechanism for state purchases of federal project water on an interim basis which provides for a more efficient and economical use of both systems. In adding certainty to the operation of the two projects, environmental concerns as well as water supply needs can be handled fairly.

I believe the agreement provides for an equitable division of responsibility while protecting the integrity of both projects and I urge your approval of S. 1192.

This completes my testimony.

Senator MURKOWSKI. Thank you. We will treasure that message, Senator, and I appreciate your brevity.

Senator CRANSTON. Thank you.

Senator MURKOWSKI. We'll recess for the vote. We should be back in just a few minutes.

[A brief recess was taken.]

Senator MURKOWSKI. I call the hearing of the Subcommittee on Water and Power of the Committee on Energy and Natural Resources back to order.

Before I interrupted for the call of the Chamber, we were hearing testimony from Senator Jim Abdnor, and Senator Abdnor, I would ask that you begin at your convenience wherever you may wish to go back and initiate your testimony.

Senator ABDNOR. I'll back up just one little bit here to put it all in the right order.

To date, South Dakota has received very little in the way of promised benefits. As I mentioned earlier, only 3 of 170 programs, and for South Dakotans to realize a portion of the benefits that were promised them.

An illustration of these benefits can be seen with the Lower Brule Sioux Tribe in South Dakota where the Grass Rope irrigation project has produced large crop yields and provided economic opportunity. And I would like to submit an Associated Press news story detailing the benefits of the Grass Rope project.[1]

Through the integration into the reclamation program and the benefit of Pick-Sloan low-cost power, the Hilltop and the Gray Goose project will continue as a stabilizing element in our economy. At this time I would like to submit for the record two letters expressing support for this legislation.

The first one is from Loren Zingmark, general manager of the East River Electric Power Cooperative in South Dakota, and the second is from Fred Simonton, executive director of the Mid-West Electric Consumers Association. Both power groups support S. 1131, along with the local people in South Dakota.

With this support in hand, I urge this committee to join in support of this legislation. This legislation is vital to the enhancement of this Nation's national resources and to the stability of South Dakota's agricultural economy.

And again, Mr. Chairman, I would ask that those two letters be inserted in the record.

Senator MURKOWSKI. Without objection.

Senator ABDNOR. Mr. Chairman, this is not the first piece of legislation I have introduced to provide South Dakotans with necessary water development. This is not the first time I've attempted to secure some of the benefits due to South Dakotans for the economic sacrifice they made to provide flood control for the citizens of other States. To date, South Dakota has received very little in the way of promised benefits, and as I mentioned earlier, only 3 of 170 megawatts of low-cost power due to South Dakotans has been received.

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[1] The article has been retained in subcommittee files.

Mr. Chairman, in our support for the Hilltop and the Gray Goose project we are asking only for a small portion of what has been promised us. As we move ahead, Senator Murkowski, I look forward to working with you and the committee on these very important projects.

Again, I want to say thank you for this opportunity, and I know you've heard me time and time again like a broken record, but we feel so strongly that South Dakota has been left out of all the benefits that were ever to be attributed to the Missouri River dam reservoirs. And this is just a small, small step to repaying South Dakota not only for what we feel is due us but we think is very necessary to the economy of South Dakota.

Thank you very much.

[The prepared statement of Senator Abdnor and letters submitted follow:]

SENATOR JAMES ABDNOR

ON THE

HILLTOP AND GRAY GOOSE IRRIGATION PROJECTS

BEFORE THE

WATER AND POWER SUBCOMMITTEE

JULY 16, 1985

LET ME SAY, MR. CHAIRMAN, THAT I GREATLY APPRECIATE YOUR ACTION IN CONVENING THIS HEARING TODAY. AND LET ME ALSO ADD A SPECIAL THANKS TO MY COLLEAGUE, SENATOR CRANSTON, WHO WAS SCHEDULED TO TESTIFY FIRST BUT GRACIOUSLY ALLOWED ME TO PROCEED SO THAT I MIGHT GET TO AN ENVIRONMENT AND PUBLIC WORKS MARKUP.

MR. CHAIRMAN, YOUR HARD WORK AND COMMITMENT GREATLY ENHANCE THE PROSPECT FOR FUTURE DEVELOPMENT OF ALL RECLAMATION PROJECTS, AND I APPLAUD YOUR EFFORTS.

THE HILLTOP AND GREY GOOSE IRRIGATION PROJECTS ARE IMPORTANT, NOT ONLY TO THE IRRIGATORS THEMSELVES, BUT ALSO TO THE LOCAL COMMUNITIES THEY HELP TO SUPPORT. IRRIGATION IS VITALLY IMPORTANT TO THE STABILITY OF SOUTH DAKOTA'S ECONOMY. WITH THOSE FACTS IN MIND, I INTRODUCED S. 1131 TO INTEGRATE THE PROJECTS INTO THE PICK-SLOAN MISSOURI BASIN PROGRAM.

SENATOR PRESSLER, CONGRESSMAN DASCHLE, GOVERNOR JANKLOW, AND I STAND UNITED IN SUPPORT OF THESE IRRIGATION DISTRICTS AND THE NEED FOR THE FEDERAL GOVERNMENT TO HONOR ITS 1944 COMMITMENT TO SOUTH DAKOTANS.

THE PEOPLE OF MONTANA, NORTH DAKOTA, AND SOUTH DAKOTA LOST TWO MILLION ACRES OF LAND WHEN THE MAINSTEM DAMS WERE PLACED IN OUR STATES. THESE MAINSTEM DAMS PROTECT OUR DOWNSTREAM NEIGHBORS FROM THE FLOODING PROBLEMS THEY ONCE EXPERIENCED. IT REQUIRED A GREAT ECONOMIC SACRIFICE ON THE PART OF OUR STATES TO PROVIDE

THAT FLOOD PROTECTION. IN RETURN, WE WERE TO HAVE RECEIVED CERTAIN BENEFITS. THEY HAVE NOT BEEN REALIZED.

UNDER THE PICK-SLOAN MISSOURI BASIN PROGRAM, SOUTH DAKOTANS WERE TO HAVE RECEIVED 170 MEGAWATTS OF LOW-COST POWER FOR IRRIGATION PURPOSES. **TO DATE, WE HAVE RECEIVED ONLY 3 MEGAWATTS OF THE POWER OWED TO US.** WE CAN START, TODAY, WITH THE HILLTOP AND GRAY GOOSE IRRIGATION PROJECTS. THESE TWO PROJECTS ARE A MERE "DROP IN THE BUCKET" WHEN COMPARED TO THE EXTENSIVE LONG-OVERDUE OBLIGATIONS DUE TO THE PEOPLE OF SOUTH DAKOTA.

THESE TWO DISTRICTS IRRIGATE 5,000 ACRES IN THE CENTRAL PORTION OF SOUTH DAKOTA. DUE TO THE INCREASE IN ENERGY COSTS-- OVER 300 PERCENT SINCE 1977-- THE PROJECTS ARE FACING FINANCIALLY DIFFICULT TIMES. WHILE THEIR LOANS WOULD REMAIN UNDER THE FARMERS HOME ADMINISTRATION, THE PROPOSED LEGISLATION WOULD DO THE FOLLOWING: (1) PROVIDE PICK-SLOAN POWER TO THE DISTRICTS, (2) INTEGRATE THE PROJECTS INTO THE RECLAMATION PROGRAM WHERE THE

IRRIGATION DISTRICTS WOULD BE RESPONSIBLE FOR THE SUB-ALLOCATED COSTS, AND (3) RETAIN THE FINANCIAL INTEGRITY OF THE PROJECTS AND THE CURRENT FEDERAL INVESTMENT IN THEM. THE HILLTOP AND GRAY GOOSE LEGISLATION **WILL NOT** REQUIRE ANY NEW FEDERAL EXPENDITURES.

OTHER PROJECTS IN THE PAST HAVE BEEN INTEGRATED INTO THE RECLAMATION PROGRAM. FOR INSTANCE, THE OMAHA IRRIGATION PROJECT IN NEBRASKA INITIALLY WAS NOT A BUREAU OF RECLAMATION PROJECT, BUT WAS AUTHORIZED IN PUBLIC LAW 97-273 TO RECEIVE LOW-COST POWER.

THERE ARE OTHER INSTANCES WHERE AN IRRIGATION PROJECT WAS STARTED UNDER EITHER A PRIVATE INTEREST OR ANOTHER FEDERAL AGENCY, BUT WAS INTEGRATED INTO THE RECLAMATION PROGRAM AT A LATER POINT IN TIME. THE HILLTOP AND GRAY GOOSE PROJECTS **DO NOT**, IN ANY WAY, SET A NEW PRECEDENT IN WATER DEVELOPMENT. THIS PROCESS WILL CONTINUE TO BE A MEANS TO INTEGRATE PROJECTS INTO THE RECLAMATION

PROGRAM AND FOR SOUTH DAKOTANS TO REALIZE A PORTION OF THE BENEFITS THAT WERE PROMISED TO THEM.

AN ILLUSTRATION OF THOSE BENEFITS CAN BE SEEN WITH THE LOWER BRULE SIOUX TRIBE IN SOUTH DAKOTA, WHERE THE GRASSROPE IRRIGATION PROJECT HAS PRODUCED LARGE CROP YIELDS AND PROVIDED ECONOMIC OPPORTUNITIES. I WOULD LIKE TO INSERT INTO THE RECORD AN ASSOCIATED PRESS NEWS STORY DETAILING THE BENEFITS OF THE GRASSROPE PROJECT.

THROUGH THE INTEGRATION INTO THE RECLAMATION PROGRAM AND THE BENEFIT OF PICK-SLOAN, LOW-COST POWER, THE HILLTOP AND GRAY GOOSE PROJECTS WILL CONTINUE AS A STABILIZING ELEMENT IN OUR ECONOMY.

AT THIS TIME, I WOULD LIKE TO SUBMIT FOR THE RECORD TWO LETTERS EXPRESSING SUPPORT FOR THIS LEGISLATION. THE FIRST ONE IS FROM LOREN ZINGMARK, GENERAL MANAGER OF THE EAST RIVER ELECTRIC POWER COOPERATIVE IN SOUTH DAKOTA, AND THE SECOND IS FROM FRED

SIMONTON, EXECUTIVE DIRECTOR OF THE MID-WEST ELECTRIC CONSUMERS ASSOCIATION. BOTH POWER GROUPS SUPPORT S. 1131, ALONG WITH THE LOCAL PEOPLE IN SOUTH DAKOTA. WITH THIS SUPPORT IN HAND, I URGE THIS COMMITTEE TO JOIN IN SUPPORT OF THIS LEGISLATION. THIS LEGISLATION IS VITAL TO ENHANCEMENT OF THIS NATION'S NATURAL RESOURCES AND TO THE STABLITY OF SOUTH DAKOTA'S AGRICULTURAL ECONOMY.

MR. CHAIRMAN, THIS IS NOT THE FIRST PIECE OF LEGISLATION I HAVE INTRODUCED TO PROVIDE SOUTH DAKOTANS WITH NECESSARY WATER DEVELOPMENT. THIS IS NOT THE FIRST TIME I HAVE ATTEMPTED TO SECURE SOME OF THE BENEFITS DUE TO SOUTH DAKOTANS FOR THE ECONOMIC SACRIFICE THEY MADE TO PROVIDE FLOOD CONTROL FOR CITIZENS OF OTHER STATES.

TO DATE, SOUTH DAKOTA HAS RECEIVED VERY LITTLE IN THE WAY OF PROMISED BENEFITS. AS I MENTIONED EARLIER, ONLY THREE OF 170

MEGAWATTS OF LOW-COST POWER DUE TO SOUTH DAKOTANS HAS BEEN RECEIVED.

MR. CHAIRMAN, IN OUR SUPPORT FOR THE HILLTOP AND GREY GOOSE PROJECTS WE ARE ASKING FOR ONLY A SMALL PORTION OF WHAT HAS BEEN PROMISED US. AS WE MOVE AHEAD, CHAIRMAN MURKOWSKI, I LOOK FORWARD TO WORKING WITH YOU ON THESE VERY IMPORTANT PROJECTS.

Supplying
25 Member
Systems
With Low
Cost Power

East
River
ELECTRIC POWER COOPERATIVE, INC.
121 S.E. First St., P.O. Drawer E
MADISON, SOUTH DAKOTA 57042
PHONE 605-256-4536
LOREN ZINGMARK, GEN. MGR.

March 25, 1985

The Honorable James Abdnor
United States Senator
SH-309 Senate Office Building
Washington, D. C. 20510

Dear Jim:

Thank you for your letter of March 5, 1985 with which you forwarded the February 20, 1985 draft of legislation to integrate the Grey Goose and Hilltop Irrigation Projects into the Pick-Sloan Missouri Basin Program. While East River does not have any membership resolution specifically concerning the Grey Goose and Hilltop Projects, East River has long supported the development of Federal water resource projects within the framework of the Pick-Sloan Missouri Basin Program. Our review of the proposed legislation concerning these projects appears to fall within that framework. If special legislation is to be adopted for these two projects, we believe the concept embodied in your draft legislative proposal of February 20 is on the right track.

Sincerely,

Loren

Loren A. Zingmark
General Manager

LZ:JLN:cet

cc: Bob Neufeld
Dick Lloyd

Mid-West Electric Consumers Association, Inc.

EVERGREEN EXECUTIVE BUILDING
27972 MEADOW DRIVE, SUITE 300
P.O. BOX 910
EVERGREEN, COLORADO 80439
(303) 674-6675

LOW COST POWER FOR EVERYONE

June 11, 1985

Senator James Abdnor
United States Senate
Washington, D.C. 20510

Dear Senator Abdnor:

Thank you for sending to me a copy of S.1131 for our review.

I have checked with our members in South Dakota, and it meets with their approval as well as with the members of Mid-West in the other Missouri River Basin states.

Best Regards,

Fred

Fred G. Simonton
Executive Director

FGS/sp

Senator MURKOWSKI. Thank you very much, Senator Abdnor, and I would acknowledge that you have made that point on more than one occasion. And observing the way this place works, why, obviously that is the best course of action to take because it seems like the squeaky wheel gets the grease. And we've heard your squeaks.

Senator ABDNOR. Well, I'm going to run off to another committee where we have a water bill pending.

Thank you.

Senator MURKOWSKI. Thank you very much, and I also want to acknowledge Senator Pressler and Senator Cranston whose testimony was enter into the record.

I want to now call upon the Honorable William Janklow, Governor of the State of South Dakota.

I welcome you, Governor, before this committee. We look forward to your testimony.

STATEMENT OF HON. WILLIAM J. JANKLOW, GOVERNOR, STATE OF SOUTH DAKOTA

Governor JANKLOW. Senator Murkowski, thank you very much, and I would like to start off by saying we remember fondly the visit that you took, the time and effort you took as a Senator from Alaska a couple of years ago to come to South Dakota, to go to our communities, and to listen to what can best be described as the divergence of opinion, charitably speaking——

Senator MURKOWSKI. I recall your hospitality, too, Governor.

Governor JANKLOW [continuing]. That our people have with respect to water development.

We look forward to you coming back to visit us this fall. I would suggest you make that the third weekend in October since that's the opening of pheasant season, and I understand that the one piece of gamebird in America that Alaska doesn't have we do, and we look forward to your challenge to enjoy the Governor's hunt with us. You'll be getting an invitation.

Senator MURKOWSKI. Thank you very much, Governor, and I have noted that date. I'm sure the record will remind me of that.

I want to compliment you on the hospitality you extended to me and members of my staff during the hearing in Pierre. You hosted us to an evening at the Governor's mansion and gave us an opportunity to meet with your colleagues, and as I recall that particular time, you had just instituted a rather extraordinary experiment, that of operating a State railroad.

You had just taken over, as a State the railroads that Milwaukee had abandoned, and we in Alaska have also embarked on that great adventure by purchasing the Alaska Railroad from the Federal Government. So at some point in time, it would be appropriate that we share notes.

In the meantime, I do welcome you and look forward to your testimony.

Governor JANKLOW. Thank you, Senator.

Senator, after the election last fall I appeared before Congressman Kazen's committee to first suggest to the Congress that Hilltop Heights and Gray Goose be eligible for consideration by the National Government, specifically the Congress and the executive branch for Pick-Sloan irrigation benefits with respect to low cost electric power, and by low cost I mean the hydropower that's generated through the Pick-Sloan projects.

What we're talking about may sound like a small number. It's 18 families out of 230 million Americans, but it's 18 families who went and put their capital, and their investment, and their fortunes, whatever they were worth, into an investment to develop irrigation which was the National Government's policy along the Missouri River. They received assistance in the form of additional capital from the Farmers Home Administration.

If we are unsuccessful in securing this type of assistance for these people, they are all unanimously going broke. Every one of them will be in bankruptcy. Every one of them will lose all their worldly possessions for all practical purposes, and the National Treasury stands to lose the equity in the loans that they have extended to these individuals through the Farmers Home Administration.

The Gray Goose project is 3,500 acres out of the tens of millions that are farmed in America. The Hilltop Heights project is 2,000 acres. And here's a unique opportunity to make a departure from what has traditionally been the method of water development in this country.

Historically what they do is they come up with a reclamation project, large expenditures from the National Treasury for feasibility studies, large expenditures for engineering, large expenditures for construction, and large expenditures for contingency costs.

Here's an opportunity where all of that has been done, and the only missing ingredient, the exclusive missing ingredient is the ability to operate at an effective price because of really what's the prohibitive cost of the electrical power that these individuals have to purchase.

This will not cost the National Treasury a dime. It will save the taxpayers of America money. Very seldom does someone come before the National Government and talk about how to save money. This will save the National Treasury money because these individuals will be able to pay back the loans they have already received from the Government.

But they will not have to in any way take anything from the Treasury. They will pay the exact same cost now that is being paid for that electricity. The individuals that receive that power have consented and agreed to support this particular legislation, and I think that's important.

The Rural Electric Cooperatives, the Rural Electric Associations, the Missouri River Power Basin Group have all supported through official action the request of these individuals.

The dams in South Dakota that were built to control the floods on the Missouri River so our friends in Nebraska and Iowa and Missouri would never flood again, permanently flooded and destroyed 530,000 acres of the State of South Dakota; 828 square miles, which is more than the entire land mass of the State of Rhode Island, is now under the Missouri River in our State. In return for that, the National Government made a commitment to our people. That commitment was that one of the things we would receive was hydroelectric power generated from those dams to be used for development within our State.

Of the 1,500 megawatts of power generated within South Dakota, 170 megawatts, a little less than 8 percent, were received for our State. Since 1958, or 30 years, we've only received 3 megawatts of that. The one other set of statistics I will give you is that our neighbor to the south, our good neighbors in Nebraska, have over 7 million acres under irrigation.

The State of South Dakota has less than 500,000 acres under irrigation, 13 times as much. No State west of the Mississippi River in what we will call reclamation country, not one State in the Union that receives reclamation benefits has less acres under irrigation than the State of South Dakota in the lower 48 States. We are really at the bottom end of what could be called the totem pole.

This does not establish any unique precedent. As a matter of fact, the Buford-Trenton project in the State of North Dakota, and the Kinsey project in the State of Montana, are both private irrigation projects that were developed according to the same standards as these individuals had developed their lands, that have been made eligible under regulatory action by the National Government in the past and receive now low cost hydroelectric Pick-Sloan type power.

So what we are asking is because the rules have changed in the regulatory climate, we're asking for legislation that will accomplish for these people what heretofore had been done almost exclusively by the executive branch of our National Government.

One additional thing that I'd like to suggest to the committee because I really think that it's very important is we talk now about the overabundance, we talk now about the peculiar problems that we're having with respect to some segments of our economy who are not sharing in and not being made a part of this national recovery.

Here is a group of people who did not overextend themselves, who did not undercapitalize themselves, and who took no unnecessary risk, but through no fault of their own, having the world price of energy change has made it just absolutely uneconomical and prohibitive for them to be able to continue.

I'd like to offer one additional piece of comment, if I may, and that's with respect to Senate bill 1171, and very briefly, Senate bill 1171 is the Small Projects Program, the small reclamation program, and Western States like California, Arizona, Idaho, Washington, and Nebraska have received very good benefit from this type of program.

But now as it approaches the end of its expenditure authority or the funds that it has available, States like mine have not been able to benefit at all. And we would only encourage the committee to give serious consideration to the enactment of that legislation also.

But in closing, I'd like to say that I can't honestly think of anything that offers a better opportunity to the National Government, the people of America. If this legislation is passed, it will only affect a small group, but it will be a group that won't take a penny from the National Treasury; it will take no expenditure authority from the National Government, and it will allow debts that these individuals have incurred privately and publicly through the National Treasury to be repaid back so they can go on carrying out their economic futures.

And with that, I thank you very much for your indulgence and consideration in allowing me to come here today.

[The prepared statement of Governor Janklow follows:]

STATEMENT OF
WILLIAM J. JANKLOW
GOVERNOR
STATE OF SOUTH DAKOTA

ON S. 1131
BEFORE THE

SUBCOMMITTEE ON WATER AND POWER RESOURCES
COMMITTEE ON ENERGY AND NATURAL RESOURCES
UNITED STATES SENATE

JULY 16, 1985

Mr. Chairman, the Hilltop and Gray Goose legislation before you (S. 1131) is simply a matter of equitable treatment. This legislation will allow South Dakota to partially share in the wealth extracted from the state via the Missouri River mainstem reservoir system. S. 1131 will allow the Hilltop and Gray Goose irrigation projects to become integrated units of the Missouri Basin Pick-Sloan program and to utilize a small portion of the Pick-Sloan power reserved for irrigation pumping purposes.

This legislation is consistent with the basic principles of the federal reclamation program. Contrary to the arguments of some interests, S. 1131 is not a dangerous precedent and will not encourage a raid on the use of Pick-Sloan pumping power. Congress has previously integrated the Colorado-Big Thompson, Kendrick, Shoshone and North Platte projects as units of the Pick-Sloan program; Hilltop and Gray Goose should be afforded the same opportunity. Also, there are a number of other small irrigation projects in the Missouri Basin that receive Pick-Sloan irrigation pumping power even though they are not integrated Pick-Sloan units. Clearly, Hilltop and Gray Goose are not asking for special treatment.

South Dakota has provided much of the land required for the Missouri River mainstem reservoirs and, in partial exchange, we have been allocated at least 170 MW of Pick-Sloan power for irrigation pumping purposes. To date, however, we have not yet been able to utilize such power for irrigation. We believe that South Dakota should be able to utilize the Pick-Sloan power allocated to us for the irrigation projects we deem most appropriate within certain limitations. Specifically, in order to be eligible for Pick-Sloan power each irrigation project: 1) must be a legally established public entity; 2) must utilize the federally developed Pick-Sloan system for water supply; and 3) must not exceed the acreage limitations established by the reclamation statutes. These limitations keep the use of the power squarely within its originally intended purposes.

S. 1131 will not adversely affect existing Pick-Sloan preference power customers. The four Missouri River dams in South Dakota produce 1,480 MW of power. The Hilltop and Gray Goose projects combined would only utilize 5 MW of this power for less than six months per year. This legislation has been reviewed by the East River Electric Power Cooperative, Inc., and by the Missouri Electric Consumers Association. Both of these organizations are stalwart defenders of public power principles and preference power customers; neither organization has any objection to S. 1131.

The Hilltop and Gray Goose irrigation districts are comprised entirely of family farmers. The Hilltop and Gray Goose irrigators obtained FmHA financing to construct their project, and have admirably operated them ever since their completion. Unfortunately, due to the inequities of current federal policies, the Hilltop and Gray Goose projects have not been able to utilize the power generated by the federal dams located only a few miles from each respective irrigation district. It is time for Congress to correct this maltreatment.

In regard to another matter before this Subcommittee, we would like to offer our strong support for the small reclamation project legislation (S. 1171). From the South Dakota perspective, this legislation is another matter of equitable treatment.

We understand that the small reclamation program has been a very valuable development tool for such states as California, Arizona, Idaho, Washington, and Nebraska. We certainly have no objection to these states utilizing the small reclamation program for its intended purpose. Unfortunately, now that South Dakota might be in a position to also benefit from this program, we find that program expenditures are fast approaching the ceiling contained in the original authorization legislation.

South Dakota recognizes the need to exercise fiscal responsibility and constraint, especially at the federal level given the massive budget deficit. At the same time, however, Congress must be fair in its treatment of the states and must subsequently approve S. 1171.

Senator MURKOWSKI. Thank you, Governor. You make a very strong case.

I'm curious to know if you could enlighten me on the rationale behind the apparent objection of the administration to support this legislation.

Governor JANKLOW. Senator, I don't understand. I have to believe it's tied up somehow in the OMB philosophy of raising the hydroelectric rates everyplace in the country where there are historical reclamation projects.

Let me say this: I don't even oppose that. I'm not necessarily opposed to it, but you and I both come from an area of the country where a deal is a deal. You don't have to do it in writing, you don't need a bunch of lawyers to get together. We can shake hands and make a bargain and keep it.

This is a bargain that South Dakota made way back in 1944, carried through in 1958, and we've never received the benefit of it. We talk about broken treaties with our Indian friends, we talk about broken treaties and agreements with others, but a nation that can't even keep its word can't be respected for anything. I'm not suggesting this country can't keep its word, I'm suggesting it's time they started with respect to the deals with my State.

But I really think it's tied up in the whole concept that OMB has had of raising the amount of charges that they want to have for hydro projects. And I don't object to that, but don't change our rules. After the season's over, then we change the rules for the next seasons, but we don't change the distance between the pitcher's mound and home plate after the game has started. Our game has already started. It just happens to be a longer game than most.

Senator MURKOWSKI. You indicated that it would be no additional cost to the Government, and I assume that you're referring to the potential of the Federal Government generating more revenues as a consequence of increasing hydro rates.

Governor JANKLOW. No, sir. There's 1,480 megawatts produced on the river now. That's its capacity. All 1,480 megawatts are being purchased by users someplace. Those users have said we agree that you can take these 5 or 6 megawatts and transfer them to another set of users that will join us and take it out of our share.

They've agreed to that, which is phenomenal to have the Rural Electric Cooperatives, the REA's, and the Missouri Basin Power Users Group all agree to that. They've all said that they're willing to let that happen. So it will really come out of their allocation.

They're paying, for example, two and a half mills now. These Hilltop and Gray Goose people will pay their two and a half mills plus the wheeling charges. So the fiscal impact to the treasury is neutral. And by the way, if someone is ever successful in raising all the hydroelectric rates nationally, these folks would be affected like that just like all the rest of the users in the basin.

Senator MURKOWSKI. So that's your basic point, OMB's efforts to try to increase hydro rates throughout the country.

Governor JANKLOW. That refutes it?

Senator MURKOWSKI. No; that basically explains your logic.

Governor JANKLOW. That's what I think. They haven't told me because getting something out of OMB, it's easier to get it out of the Soviet Union.

Senator MURKOWSKI. Well, I'm just trying to relate to this in the sense of those that are in opposition to it. We've already indicated that it's revenue neutral in the sense that you're not asking for additional funding from the Federal Government.

You made reference to a bargain is a bargain, and you don't need a dozen lawyers to resolve it. Have you in your administration as Governor had any indication that the Federal Government has seen fit to meet certain portions of the informal, nonwritten agreement with regard to the obligation due the residents of your State who made significant sacrifices some years ago in order for the likelihood of the Government going ahead and fulfilling its commitment, or has it just been a situation continually where you've been at loggerheads to get the Government to fulfill its obligation?

Governor JANKLOW. Senator, I've honestly found, very candidly, I've found support among high level appointees within at least this administration. The last administration I didn't find any. I mean, they killed a lot of projects in the West. I've found a lot of the appointees within this administration, senior level, very, very supportive of what we're trying to do to develop especially our low cost approach.

Mine is the first State in history to cost share feasibility studies on Federal water projects. We cost share every feasibility that has gone on in the 7 years I've been Governor, for example, and the bureaucracy, the appointive bureaucracy has been very supportive.

But it always appears to be an OMB problem, and I guess that comes back to money, and nobody has been more critical, frankly, in America of the inability of this country to handle its fiscal affairs than I've been. I'm the last person in the world who would come back here to Washington, given my rhetoric, and suggest that we ought to start new expenditures on anything until we get our fiscal house in order.

But this project is revenue neutral. I don't honestly understand their opposition. I just am dumbfounded. I don't know what it is.

Senator MURKOWSKI. Well, we'll look to the administration's witnesses for a little elaboration on their particular point of view.

Governor JANKLOW. Senator, I really appreciate your courtesy. You, like I said when I started, you don't come from our State, but you have genuinely over the several years I've known you shown a sincere interest in developmental aspects of building America, and that includes areas in addition to Alaska, and for that there are some of us that are really appreciative of your efforts.

Senator MURKOWSKI. Thank you, Governor. I appreciate your comments.

Governor JANKLOW. Thank you.

Senator MURKOWSKI. We have another vote on. I'm going to depart from procedure in order to expedite this process, and while I vote—well, I think I want to be here for the next witnesses.

Russ, you can call the witnesses and begin the most lengthy testimony, but I want to question the witnesses with regard to the discussion we just had with the Governor.

I have a vote now and I have to go over there. I will be back in about 5 minutes, and why don't you proceed, call the witnesses, and get started.

Mr. BROWN. The next witness before the committee is the Honorable Robert Broadbent, Assistant Secretary for Water and Science, and he's accompanied by Mr. Richard Atwater, Special Assistant to the Commissioner of Reclamation; Mr. Phillip Cohen, Chief Hydrologist for the United States Geological Survey, and Mr. Joseph R. Blum, Deputy Regional Director, Western Region, Fish and Wildlife Service.

In the absence of Chairman Murkowski, Mr. Broadbent, you may proceed as you wish.

STATEMENT OF HON. ROBERT N. BROADBENT, ASSISTANT SECRETARY FOR WATER AND SCIENCE, DEPARTMENT OF THE INTERIOR; ACCOMPANIED BY RICHARD ATWATER, SPECIAL ASSISTANT TO THE COMMISSIONER OF RECLAMATION; PHILLIP COHEN, CHIEF HYDROLOGIST, U.S. GEOLOGICAL SURVEY; AND JOSEPH R. BLUM, DEPUTY REGIONAL DIRECTOR, WESTERN REGION, FISH AND WILDLIFE SERVICE

Mr. BROADBENT. Mr. Brown, what bills do you want to hear? In what order? Do you have any——

Mr. BROWN. Well, they were placed on the agenda in numerical sequence, so I would suggest that you proceed with S. 1131, the Hilltop-Gray Goose bill introduced by Senator Abdnor and Senator Pressler.

Mr. BROADBENT. Mr. Brown, it's my pleasure to appear before the committee today representing the Department of the Interior on S. 1131. My statement is only a page long, and I think I'd like, with your permission, to put it in the record and let it stand for what it says, but I would like to make a few additional comments if I might. It'll probably be a little longer than the statement.

Do you want to wait until after Senator—Chairman Murkowski comes back or should I just enter that in the record and go on and then maybe do this a little later?

Mr. BROWN. Yes. Why don't you just submit that statement for the record and then proceed with your written statement on the next bill, and then when the chairman returns, I am sure that he would appreciate receiving your candid remarks on the Hilltop-Gray Goose legislation.

Mr. BROADBENT. Our next statement is on S. 1157, which is a bill to authorize the Secretary of the Interior to perform studies relating to the disposal of drain water and to construct interim corrective measures deemed necessary for the San Luis interceptor drain.

On that one I again would like to have my statement entered into the record and would like to recognize that I have with me today, as has been stated, Mr. Atwater from the Bureau of Reclamation; Mr. Cohen, the Chief Hydrologist from the U.S. Geological Survey; and Joe Blum, Assistant Regional Director for the Fish and Wildlife Service.

Again I would like to ask that this statement be entered in the record. We gave similar testimony. The statement is rather lengthy with the exhibits. I'm sure you don't want to make the exhibits part of the record, but we would like to have those exhibits attached as reference.

Mr. **Brown**. The referenced exhibits will be retained in the official committee files.

Mr. **Broadbent**. All right, and the statement is rather long, but again I would like to indicate for the record—and I see the frustration of many people as I saw the statement of Senator Cranston and some of the other people who have been involved in the tough problem we have on the west side of the San Joaquin Valley as we try to deal with selenium, which has gotten into the food chain, really and has caused harmful effects to some of the wildlife area by virtue of it being leached out of the soil.

Selenium is in the soil on the west side of the San Joaquin Valley, and because of irrigating, the drainage water has leached the selenium out of the soil, and it has caused a serious problem.

I think this is the type of a problem that we really didn't have much of an understanding of before 1981, and I think that's important for the committee to recognize here. Studies were done on the San Luis drain in an attempt to find the best method of taking the drainage water out of the west side of the San Joaquin Valley and moving it to a disposal area. As part of that study done back in 1975 by the Interdrainage Program, a committee was set up, and they came out with a recommendation in 1979 which said that the water should be taken to the Bay for disposal.

As a result of that the Bureau of Reclamation then went to the State Water Resources Control Board and asked for permission to go ahead with that project, and they set an investigation program on us that was to encompass about 3 years. When we started on this program in 1981, we first found selenium in some of the fish in that area. In 1982 we started further work. In 1983 and 1984, of course, we found selenium in some of the wild fowl that inhabit Kesterson Reservoir, or move in and out of Kesterson Reservoir.

Again, it's interesting to note that when we started in 1981, the laboratory procedures for measuring selenium were such that we had no quality assurance on many of the lab tests we did. There was no way at that time to really measure, within parts per billion that we're measuring in, selenium and do it accurately in lab after lab. And so we have been in sort of a pioneering mode, looking at trace elements, particularly selenium, as it has gone through drainage water and drained into wildlife habitat areas on the west side of the valley.

As a result of this, there has been a lot of work done, and there has been a coordinating committee set up of the primary interested parties in the Department of the Interior. Those parties, of course, are the parties that are sitting with me today—the Bureau of Reclamation, which has responsibility for irrigated agriculture, the scientific expertise of the U.S. Geological Survey as we look at the hydrology and the geology of the rock structures, and certainly the expertise of the Fish and Wildlife Service as they look at the flora and fauna.

Now, I would like to tell you that we have an answer to that problem. We don't. We have a rather extensive scientific investigation that we project would take 3 or 4 years to begin to get some of the tough answers. We have since been ordered by the State water resources control board to take action to close Kesterson. We have taken that action and submitted a plan to them on July 5 of this year. They have yet to respond to that plan, but it is a long comprehensive plan, and it's going to take a little time.

We have done many studies on hydrology, geology and wildlife in that area, and we are beginning to get some results.

As I look at it, we have three problems on the west side of the valley that have to be dealt with. We have the immediate problem of Kesterson and the cleanup of Kesterson, which will require authorization and appropriations for the Government to participate in its share; we have the additional, broader responsibility of looking at the area immediately surrounding Kesterson, which is broadly called the Grasslands area, which involves primarily private clubs, several Fish and Wildlife Service refuges, and several State refuges, all of which are in the Pacific flyway and are part of the necessary flyway to protect the wild fowl habitat of that flyway. And we feel that we've got to have some immediate answers on Grasslands.

It's an extremely complicated problem. It could be that we have the same problem in Grasslands that we have in Kesterson, and if we do, it's on a much broader basis. So much of the study money would go toward looking at that problem and identifying how to take care of it, how do we solve the problem.

And then we have the broader problem of the west side of the San Joaquin Valley. The west side of the San Joaquin Valley has probably a million acres of irrigated agriculture, of which in the Reclamation part of it, probably 500,000 acres, is going to need irrigation service, and maybe about a half of that, or less than a half of it has presently irrigation service.

We are told by the Geological Survey that the rock structure on the west side of that valley, from the southern part to the northern part, has much of the geology that would indicate that there may be selenium throughout it, and indeed, there have been selenium samples taken from Kern County clear on up past Kesterson and past the Grasslands area.

So again it's a broad problem. The Department of the Interior has basically five goals in the study program. No. 1 is to first of all, of course, assure the public health. Certainly if there is selenium at any level that threatens the public health, we must take immediate action.

No. 2, to protect and improve the water quality of the San Joaquin River because much of this drainage water and much of the water that is flowing off these mountains ultimately drains into the San Joaquin River; whether it does by a direct canal or indirectly through subsurface drainage, it still gets there.

Third is to protect the groundwater supplies to make sure that there is no selenium contamination into the deeper groundwater aquifer that is below the clay barrier that is about in the 15 or 20 foot level.

Fourth is to protect agricultural lands in the San Joaquin Valley which are an important part of the State's economic base.

I think it's important to recognize that this area, particularly around Kesterson where we have a problem, is in Fresno County, and Fresno County is the most productive farm county in the United States. And this area in the San Joaquin Valley has some of the most productive farmland in the country. Several of those counties are among the top 10 in farm production.

And then fifth, I think we have an ultimate responsibility, the Secretary has, under numerous acts—Fish and Wildlife Coordination Act, the Migratory Bird Act, the Endangered Species Act—to protect the beneficial uses and environmental values of the San Francisco Bay, the Sacramento, San Joaquin Valley, and the other potential receiving waters as well as the National Wildlife Refuges that are part of this.

I think I've probably talked long enough. I would like to indicate that the National Academy of Science has at our request appointed a special task force to evaluate our study program. We would welcome any kind of oversight that Congress or congressional committees would want to give to the study program. We think that the National Academy will provide a valuable service for us. We are not trying to hide anything. We are completely open, and we would intend to stay open.

The Academy meets the end of this month and will look at our draft proposed study plan for the balance of the next year or two. That study plan is part of the documents that we have asked to have submitted as exhibits.

We are asking for authorization for the expenditure of about $12-plus million next year in this study program. We need authorization because the money we are presently using is money that was authorized as part of the San Luis unit. The authorized ceiling has been reached. We have no authorization for appropriations. The Secretary, using his emergency authority, did reprogram $6 million or $7 million in to do the studies for this year, but with the opportunity that we have before Congress, I question whether we will be able to use our emergency authority again for any funds to accomplish this purpose.

So I think that if we are to continue the ongoing work, and if we are to continue the study program, that Congress is really in need of acting before the end of the fiscal year or taking some appropriate action to continue the work.

We are willing to submit to any level of scrutiny by any congressional committee or any Members of Congress that want to look at the study program. We think it's good. We think we have given it the appropriate peer review. We think it will lead to the necessary answers to solve the problem.

And if it won't, why then we are certainly going to be amenable to any type of amendment that will accomplish those purposes.

Mr. Brown, thank you very much.

[The prepared statements of Mr. Broadbent follow:]

Statement of Robert N. Broadbent
Assistant Secretary for Water and Science
Witness for the Department of the Interior before the
Subcommittee on Water and Power of the
Senate Committee on Energy and Natural Resources
on S.1131
A Bill to authorize the Secretary of the Interior to integrate
the Hilltop and Gray Goose Units into the
Pick-Sloan Missouri Basin Program, South Dakota
July 16, 1985

I am appearing today to present the views of the Department of the Interior on S.1131.

S.1131, if enacted would authorize the integration of the Hilltop Unit and the Grey Goose Unit into the Pick-Sloan Missouri Basin Program. The units would be integrated physically and financially with Federal works constructed under the Pick-Sloan Missouri Basin Program. Once authorized, Pick-Sloan Missouri Basin Program power would be made available to those two units as soon as practicable.

The two irrigation projects under consideration for integration into the Pick-Sloan program have been privately developed with financial assistance from Farmer Home Administration and have not been examined to determine if they meet criteria for Federal irrigation. No Federal studies have been conducted to determine the irrigability of the land, financial feasibility, or environmental acceptability. Also, we believe that before any addition projects are authorized to receive pumping power for main gravity lifting, an overall evaluation is required to assure that use of this limited resource is compatible with the ultimate development of the Pick-Sloan Missouri Basin Program, as authorized.

Until such studies are completed we must oppose enactment of this legislation.

This completes my statement. I would be happy to answer any questions at this time.

Rev. 7-15-85

Statement of Robert N. Broadbent
Assistant Secretary for Water and Science
Witness for the Department of the Interior before the
Subcommittee on Water and Power of the
Senate Committee on Energy and Natural Resources
on S.1157
A Bill to Authorize the Secretary of the Interior to Perform
Studies Relating to Disposal of Drain Water and to Construct
Interim Corrective Measures Deemed Necessary
for the
San Luis Interceptor Drain
July 16, 1985

Mr. Chairman, members of the Committee, my name is Robert N. Broadbent. I am the Assistant Secretary for Water and Science of the Department of the Interior. It's a pleasure for me to be here today in support of S.1157, a bill for the continued funding of Interior's comprehensive studies for the San Joaquin Valley Drainage Program. Representatives of the three agencies of our Department that are involved in the program for evaluating the problems associated with Kesterson Reservoir and San Joaquin Valley Agricultural drainage are with me today to assist in responding to any questions that the Committee may have of the Department. I would like to introduce Mr. Joseph R. Blum, Deputy Regional Director of the Fish and Wildlife Service (FWS), Mr. Phillip Cohen, Chief Hydrologist of the Water Resources Division (USGS), and Mr. Richard Atwater, Special Assistant to the Commissioner for the Bureau of Reclamation (Bureau).

BACKGROUND

Few water-related issues facing California have generated the public attention and concern that the agricultural drainage problem in the San Joaquin Valley has. The west side of the San Joaquin Valley (see exhibit 1 for map) has serious drainage and salt management problems which are having negative impacts on the area's waterfowl and farm production. A solution to the drainage water contaminant and disposal problems is critical not only for the protection of wildlife resources but also for the economic well being of the San Joaquin Valley, one of the most productive agricultural areas in the world.

Several hundred thousand acres in both the State and Federal project water service areas are now adversely affected either by inadequate drainage of salts and leaching water or because the disposal of drainage water has adversely affected valley waterfowl. The acreage affected by inadequate drainage is likely to double within the next few decades. An environmentally and economically sensible means of disposal must be found to protect the agricultural and waterfowl resources of the region.

The Federal and State service areas on the west side of the San Joaquin Valley comprise approximately 1.2 million acres. At present, about 177,000 acres are served by onfarm drainage facilities. An area of about 300,000 additional acres, needing drainage now, has no place to dispose of its drainage water.

A total of about 250,000 acres in the Federal service area is now affected by drainage problems. Drainage water from about 77,000 acres north of Mendota--about one-third of this land--is discharged by water districts into the San Joaquin River, the valley's only natural outlet. Drainage from about 8,000 acres west of Mendota is discharged into Kesterson Reservoir by way of the San Luis Drain. Lands totaling about 165,000 acres needing drainage now have no place to dispose of the drainage water. The land needing drainage is expected to increase to about 380,000 acres by the year 2020 and 500,000 acres by 2095, or about 40 percent of the land within the service area.

Approximately 325,000 acres of west-side land in the State service areas require drainage. Drainage water from about 87,000 acres in the Tulare Lake Basin is discharged into 10,500 acres of unlined evaporation ponds. Drainage water from 5,000 acres is discharged directly into the south fork of the Kings River. Lands totaling about 135,000 acres needing drainage now have no place to dispose of the drainage water.

The discovery of high levels of selenium in valley agricultural drainage water changed both the magnitude and focus of the drainage problem. Historically, the drainage problem centered on the disposal of salts. The problem has now been expanded to include management of trace elements such as arsenic, chromium, nickel, boron, and selenium.

A drainage management program to resolve both the contaminant and disposal aspects of the problem is essential to the continued agricultural productivity of much of the San Joaquin Valley area. Taking affected lands out of production would have significant adverse economic and social impacts throughout the region. Also, significant costs would be incurred for the cleanup of any contaminated ground water or ponded drainage water.

In 1960 Congress authorized construction of the San Luis Unit of the Central Valley Project. The San Luis Unit was designed to deliver a supplemental water supply to about 700,000 acres of farmland and also to provide an agricultural drain to dispose of subsurface drainage for lands within the unit. The drain was needed to prevent salt buildup and crop losses and to assure adjacent landowners that expanded irrigation would not worsen existing drainage problems.

After the San Luis Unit was authorized, the Bureau of Reclamation made plans for a drain that would extend 207 miles from Kettleman City in the southern San Joaquin Valley north to a discharge point in the western Sacramento-San Joaquin River Delta at Suisun Bay. Between 1968 and 1975, the Bureau constructed the first 85 miles of the drainage canal and the first stage of Kesterson Reservoir. The existing drain extends from the town of Five Points north to Kesterson Reservoir, located east of the town of Gustine.

The Bureau stopped construction of the San Luis Drain in 1975 to undertake technical studies to determine a final discharge point and to ensure that discharges from the drain would conform to State water-quality standards. Congress prohibited selection of a final discharge point until certain conditions had been met. Specifically, the final point of discharge:

> . . . shall not be determined until development by the Secretary of the Interior and the State of California of a plan which shall conform with the water quality standards of the State of California as approved by the Administrator of the Environmental Protection Agency, to minimize any detrimental effect of the San Luis drainage waters.

This requirement resulted from concerns expressed by the State over the potential impact of a drain discharged to the San Francisco Bay-Delta estuary.

In 1975, the California Department of Water Resources, the State Water Resources Control Board, and the Bureau initiated the Interagency Drainage Program (IDP) to evaluate drainage alternatives and recommend a course of action which would satisfy congressional requirements. The IDP report concluded in 1979 that the export of salts from the valley through a master drain for disposal in the western Delta was the most economical and environmentally acceptable solution.

Following the IDP, the Bureau initiated proceedings with the State Water Resources Control Board to obtain a permit to discharge drainage to the estuary near Chipps Island. In 1981 the State Board established conditions for obtaining a discharge permit, and the Bureau began a 3-year study to satisfy the State Board's information requirements. At about the same time, the Bureau initiated the San Luis Unit Special Study to evaluate alternatives for completion of drainage facilities for the unit. During this period, and as a direct result of studies done to meet the State Board's requirements, high levels of selenium were first detected in the San Luis Drain and Kesterson Reservoir.

Kesterson Reservoir was designed to regulate flows in the San Luis Drain for ultimate discharge to the western Delta. However, it is now used as an evaporation pond for about 6,000 to 8,000 acre-feet annually of agricultural drainage water from about 42,000 acres of land west of Mendota.

Between 1972 and 1978, most of the water discharged into Kesterson Reservoir was considered to be of good quality. Subsurface irrigation return flows began flowing into the reservoir in 1978 as drains were installed and drainage water from them was discharged into the San Luis Drain. Since January 1981, flows into the reservoir have consisted primarily of subsurface drainage water.

Since 1970, Kesterson Reservoir has been managed by the U.S. Fish and Wildlife Service (FWS) as part of the Kesterson National Wildlife Refuge. A cooperative agreement between the FWS and the Bureau governs management of the reservoir for wildlife. As stipulated in the agreement, management of the reservoir for wildlife is secondary to the main and original purpose of the reservoir for control of drainage flows. Kesterson National Wildlife Refuge comprises approximately 5,900 acres and is land that was acquired by the Bureau in 1969 for the development of a two-stage Kesterson Reservoir.

The Grassland area adjacent to the Kesterson Reservoir is an important waterfowl wintering areas in the Pacific Flyway. In recognition of this, the FWS has developed an easement acquisition program to protect 48,000 acres of habitat on private land in the West Grassland area and is now studying acquisition needs in the East Grassland area.

COMPREHENSIVE INTER-AGENCY STUDY PROGRAM

In August 1984, Governor Deukmejian and then-Secretary of the Interior William Clark appointed a State-Federal Interagency Coordination Team (see exhibit 2) to ensure that the program for evaluating alternatives for correcting the drainage problem was fully coordinated and that the work was being done scientifically and expeditiously. An interagency drainage study program has been established under the supervision of the Federal-State coordination team with scientific oversight by the National Academy of Sciences. The goals of the study program are to:

1. Assure protection of public health,

2. Protect and improve the water quality of the San Joaquin River,

3. Protect ground-water supplies,

4. Protect agricultural lands in the San Joaquin Valley which are an important part of the State's economic base, and

5. Protect the beneficial uses and environmental values of San Francisco Bay, the Sacramento-San Joaquin Delta, and other potential receiving waters.

STUDY PROGRAM

The study program is led by the three Interior agencies and California Department of Water Resources and Fish and Game in a cooperative effort to produce the information needed for evaluating alternative solutions to the drainage problems. Each Bureau and Department has its own particular expertise, and in those cases where they lack the requisite expertise, other agencies or individuals in academia, State and local governments, other Federal agencies, and the private sector will be contracted with to provide the needed professional scientific services.

The study program is currently estimated to cost approximately $40 million and will take about four or five years to complete. The following are tentative proposals pending final approval by the Interagency Technical Coordinating Team.

National Academy of Sciences (National Research Council)

In response to a request from the State of California and the Department of the Interior on December 3, 1984, the National Research Council (NRC) through its Water, Science, and Technology Board will assist in guiding the conduct of the research and evaluation of alternative solutions to the San Joaquin Valley drainage problems.

The Water, Science, and Technology Board has established a Committee on Irrigation-Induced Water Quality Problems to review the design and implementation of the multi-agency research program, providing guidance as the research progresses. (See attached Committee membership Exhibit 3). The first meeting of the Committee was held May 29, through 31 in Sacramento (See attached agenda, exhibit 4).

USGS Studies

The USGS is developing a program of interrelated and coordinated studies to determine the source, distribution, mobilization, transport, disposition, and concentration of selenium and other constituents in the water and soils of the western San Joaquin Valley and to obtain an understanding of the fate of these constituents in existing or potential discharge areas (e.g., San Joaquin River and San Francisco Bay-Delta).

These studies will:

-Determine the areal distribution of selenium and other constituents in the soils, shallow ground water, and deep ground water of the western San Joaquin Valley.

-Identify the processes which control the accumulation, mobility, and distribution of selenium in the soils and ground water.

-Determine the geohydrologic relation between the shallow, intermediate, and deep aquifers and their recharge/discharge relation with the San Joaquin River.

-Determine the geochemical and microbiological processes controlling the movement and fate of selenium in Kesterson ponds.

-Determine the hydrodynamic processes of San Francisco Bay, dilution ratios in the Sacramento-San Joaquin River delta, relations between circulation and delta outflow and circulation patterns in Suisun and San Pablo Bays.

- Determine the spatial and temporal distribution of trace elements and sediments in an indicator species of clam in Suisun Bay.

FWS Studies

In general, FWS studies address three broad issues: (a) the geographic extent and severity of agricultural drainage-created contamination of fish and wildlife resources; (b) food chain bioaccumulation; and (c) fish and wildlife toxicity.

The studies and activities now under way include: (1) hazing; (2) shorebird nesting; (3) residue analysis; (4) monitoring for contaminants in the Grassland area and; (5) planning the phased closure and cleanup of Kesterson Reservoir and the San Luis Drain. In addition, we are investigating potential removal of vegetation and food chain organisms from the reservoir.

However, nine additional studies are needed and include: (1) aquatic monitoring for contaminants; (2) toxicity of contaminants to fish and aquatic ecosystems; (3) bioaccumulation of contaminants in acquatic ecosystems; (4) uptake and loss rates of selenium in waterfowl; (5) waterfowl tolerance of chronic exposure to selenium; (6) uptake and effects of contaminants on wintering and migrating waterfowl; (7) synergistic effects of contaminants upon wildlife and; (9) a geographic information system for management. These studies are requested in the draft bill. Work is continuing by the FWS concerning contaminant analysis of food chain samples and shorebird reproduction.

Bureau of Reclamation

The Bureau of Reclamation is focusing on water collection and analysis, removal of selenium from drain water, and disposal alternatives, as well as applicable agricultural management practices. The alternatives developed will cover the broadest range of feasible technologies and will be guided by determinations of the areal extent of selenium and other chemical constituents by the USGS and by the safe environmental limits established by the FWS, the State Water Resources Control Board, and the U.S. Environmental Protection Agency. Both the Board and EPA are also participating in technical development of study plans and both provide policy oversight. Principal alternatives will look at the various treatment options including physical removal (e.g., desalination via membrane filters); biological processes for removal of chemicals (e.g., algae or microphytes are capable of assimilating selenium as are soils under certain conditions); and chemical reduction and removal. Possible alternative means of disposal include discharge into the San Joaquin River, the San Francisco Bay-Delta estuary, the Pacific Ocean, deep well injection, and evaporation/solar ponds.

FUNDING

Expenditures for work on the San Luis Drainage Studies for fiscal years 1983 and 1984 were $1,512,722 and $2,861,305 respectively. Expenditures planned for fiscal year 1985 are approximately $10 million consisting of $3 million from fiscal year 1985 budget appropriation and fiscal year 1984 carryover and $7 million in emergency funds (comprised of $1,205,000 from the Emergency Fund budget account and $5,795,000 transferred from the Construction budget account). Funding required for the study program for fiscal year 1986 is estimated at $12,400,000. However, our ability to expend these funds is dependent on enactment of authorizing legislation since we are currently at the authorized funding ceiling. Exhibit 5 shows study items and costs for FY 1985 and 1986. Exhibit 6 shows San Luis Unit actual and estimated expenditures for FY 1983 through 1986. The expected total cost for the comprehensive study effort at the present time is approximately $40,000,000. This total estimated cost is not addressed in the proposed bill for a number of reasons. Central among these reasons is that, at the request of the State of California and the Department of the Interior, the National Academy of Sciences has recently entered into a contract with the Department of the Interior to provide oversight and review of Federal and State study activities and findings. The overall work program will be independently reviewed by the National Academy of Sciences to ensure it is comprehensive, scientifically sound, and may reasonably be expected to achieve the study objectives before it is finalized. We would expect, following Academy review, to submit an authorization and appropriation request commensurate with the final study plan for your consideration. As currently envisioned, the activities to be carried out under this program will be done jointly by the Bureau, the USGS, and the FWS in conjunction with the State of California agencies and with some work performed under contract with public and private organizations. All of this work will be coordinated by the State/Federal coordination team on San Joaquin Valley Drainage established in August 1984, by the Secretary of the Interior and Governor of California. In addition, other Federal agencies, including the Environmental Protetion Agency and the Department of Agriculture, will be involved.

REPAYMENT OF STUDY PROGRAM

There are two other provisions of the proposed bill about which I would like to comment at this time. Section 2 of the bill provides for repayment of the costs incurred under these investigations. We strongly support the principle of repayment. However, there are several repayment issues we are reviewing that might require some modification to the legislation submitted earlier. We will provide you with the results of our review as soon as possible. Section 3 would

1985. The closure and cleanup plan for Kesterson Reservoir (exhibit 15) was submitted to the State Board on July 5, 1985. Attached are listings of 15 exhibits and 4 special submittals as supporting information. Copies may be obtained by contacting the Bureau of Reclamation (343-5471).

The reduction of drain water will begin this summer and will be phased to allow for development of alternative facilities. Westlands is required to complete preparation of its preliminary plan for alternative means of disposal by June 1, 1985. We have developed cost estimates on several closure scenarios for Kesterson Reservoir. Our expectation is that the costs would likely be $2.9 million for the perferred alternative, assuming that the water and sediments in Kesterson Reservoir and the San Luis Drain do not need to be disposed of in a Class I waste disposal facility. The costs for contingency closure and cleanup alternatives for Kesterson Reservoir vary from $37.3 million to $195.3 million. The actual costs will depend on the volume and character of waste that is identified and the detailed cleanup plan ultimately adopted and approved by the State Water Resources Control Board and authorized by Congress. Until such time as the cleanup strategy has been through the State review and approval process, we will remain uncertain as to what authorization to request from this Committee. However, it is clear that additional authority and appropriations will be necessary. We will work closely with this Committee over the next several months while we develop the cleanup strategy and determine the Department's need for funds to implement this strategy.

In closing, I would like to thank you for the opportunity to testify before you today, and I will be happy to respond to any questions you may have.

authorize the Federal Government to accept funds contributed from others for the purposes specified in the proposed bill. It is our expectation that the State of California will participate as a financial partner in the studies.

CLEAN-UP PLAN

A matter which is not addressed in the bill, but one which we hope to bring before this Committee in the near future, is the need for funding for the cleanup and closure of Kesterson Reservoir. On February 5 of this year, the State Water Resources Control Board ordered (see exhibit 7) the Bureau to submit within 150 days a plan to resolve the Kesterson Reservoir problem. On April 3 of this year, an agreement (exhibit 8) was reached with Westlands Water District which provides for the phased cessation of irrigation drainage flows into the reservoir.

The State Water Resources Control Board order (exhibit 7) identifies four options: (1) closure of Kesterson Reservoir in accordance with the closure requirements of Subchapter 15 of the State Toxic Pits Act and implementation of an acceptable waste disposal alternative, (2) upgrading of Kesterson Reservoir to meet the applicable requirements of Subchapter 15 of the State Toxic Pits Act, (3) discontinuing use of the reservoir as a waste management facility and implementation of appropriate cleanup measures, or (4) any other acceptable alternative.

The Bureau has evaluated 26 options for the Kesterson problem during the past year. The options are described in our January 8 and January 25, 1985, submittals to the State Board (exhibits 9 and 10). The nuisance abatement plan (exhibit 11) was submitted to the State Board on April 5, 1985, and the Kesterson Reservoir monitoring program (exhibit 12) was submitted on May 27, 7-15-85

Exhibits for July 16, 1985 Hearing on
Subcommittee on Water and Power
of the Senate Committee on Energy and Natural Resources
List of Exhibits

Exhibits	
1	Map of Kesterson Area
2	Organizational Chart of Study Committees
3	Membership of Special Committees
4	Agenda of May 29-31, 1985 with State and Federal Organizations relating to Kesterson Problem
5	San Joaquin Drainage Costs program for 1985 and 1986
6	(A) San Luis Actual Reclamation Expenses for 1983-1986 and (B) Source of Funding (1983-1985) for Reclamation, FWS, and USGS
7	Control Board Order No. WQ-85-1
8	Agreement of Department of Interior and Westlands Water District
9	January 8, 1985 Report from the Department of the Interior to the California State Water Resources Control Board
10	January 25, 1985 Report from the Department of the Interior to the California State Water Resources Control Board
11	April 5, 1985 - Nuisance Abatement Plan
12	May 27, 1985 - Monitoring Program
13	May 31, 1985 - Application of the Migratory Bird Treaty Act to the Kesterson Reservoir
14	June 3, 1985 - Westlands Water District submittal to Reclamation containing Preliminary Plan Report on Alternative Drainage Disposal Facilities (June 1985)
15	July 5, 1985 - Kesterson Reservoir Closure and Cleanup Plan (A)
15 Appendix B	June 27, 1985 - Bureau of Reclamation Water Quality Analysis

7-15-85

Special Submittals for June 16, 1985 Hearing on
Subcommittee on Water and Power
of the Senate Committee on Energy and Natural Resources
List of Exhibits

1	USGS Synoptic Survey (November 1984)
2	October 15, 1984 - Reclamation Submittal to SWRCB
3	November 16, 1984 - State Legislature Held Hearings on Kesterson Pollution Problem
4	December 17, 1984 - SWRCB Submittal

Statement of Robert N. Broadbent
Assistant Secretary - Water and Science
Department of the Interior

Witness before the Senate Subcommittee on Water and Power
of the Committee on Energy and Natural Resources
on S. 1171
to amend the Small Reclamation Projects Act of 1956.

July 16, 1985

Mr. Chairman, members of the Subcommittee, on behalf of the Department of the Interior, I am pleased to appear here today to comment on S. 1171 which would amend the Small Reclamation Projects Act to increase the appropriation ceiling by $600 million.

With one amendment to change the interest rate formula in the 1956 act and encouragement of you to consider a surplus crop amendment, we recommend enactment of S. 1171 and its companion bill in the House, H.R. 2025. An increase in the authorized ceiling will allow us to operate the program for a number of years, without any other additional authorizations.

The authorization of an increased ceiling is vital to continue the orderly planning and loan approval process of these small but important projects. The applicants, who are responsible for project planning and preparation of the the loan applications need some assurance that construction funds will be available if they are to commit time and money in this endeavor. The current authorization ceiling is only adequate to complete loans already approved. Therefore, we will not be able to fund any additional loans without an increase in the ceiling.

It should be emphasized that the cost ceiling only sets the limit on the total accumulative Federal appropriation that can be made over a number of years. It would in no way obligate the Congress to an annual Federal appropriation of that magnitude. In fact, the current $600 million (ceiling) will be appropriated over a period of 33 years (see chart,1959-1992), which is an average of only about $18 million annually. The level of annual appropriation made each year is influenced by several factors, namely the number of approved loans (projects) per year and the length of the construction period for individual projects. Over the first 30 years of the program we have averaged 5 new starts with an average construction period of 3 years. Still another significant factor in keeping the Federal loan appropriations down, is the increasing level of local contribution (cost sharing) required of the program. Therefore, we anticipate that the additional $600 million ceiling would extend the program for another 20-25 years (see chart, 1985-2010).

In addition to the 32 approved projects that are either in preconstruction or construction and will require the remainder of the current $600 million ceiling to complete, there are many other loan application reports still in the process of being developed. In fact, 11 applications are complete and under review in the Bureau of Reclamation. Another 36 projects are in various stages of planning and report preparation. The estimated value of these projects is about $500 million. In addition, there are many more projects being considered by the public and community management entities that provide water to much of the 80 percent of irrigated land that does not now benefit from Bureau assistance.

We are committed to the adoption of modern conservation features through this program. Water quality impacts of irrigation, achieving greater efficiency in water and energy use, conjunctive management of ground and surface water, water reuse including the use of sewage effluent as well as other aspects of modern water resource management require careful planning and negotiations. The zero interest rate feature of the irrigation portion of the loan makes many of these measures possible. However, if we do not receive an increase in the ceiling we maintain that this broad gauge approach to planning by the local sponsors will be discouraged. They will turn instead to quicker, simpler fixes for immediate problems and many opportunities will be lost.

The loan program serves an important need and is unique from a cost-sharing standpoint. The loan funds are repaid by the applicant who also provides significant front-end financing. Over the past 3 years local funds have averaged 22 percent of the total cost. This private funding level is the result of the Department's policy of keeping Federal subsidies (loan factors) at 50 percent or less. Currently, water users have two methods of achieving a lower loan factor. One is by providing up-front financing and the other is by repaying the Federal loan in a shorter period of time. Two recently approved loans illustrate this situation. The Ak-Chin Indian Tribe could finance only 7 percent of their project's costs but were able to repay the Federal loan in 17 years. This resulted in a loan factor of 50 percent. The East Bench Irrigation District plans to finance 36 percent of their project's cost but must have 37 years to repay the Federal loan. Their loan factor is 49 percent.

In an encouraging trend, many more States are considering steps to enhance local financial capacity and to participate directly in such projects. This is in recognition of the considerable benefits to the people of the State from these projects, from both the economic stimulus of the irrigated farming and the environmental and conservation values encouraged by the program. However, not all States are able or willing to participate at the same levels. As I have already mentioned, under present policies we have some flexibility within the loan subsidy rule to deal with these differences. Any changes should take into account these State-to-State differences.

Some local sponsors are not in a financial position to provide increased cost sharing or to finance an up-front contribution. We are currently exploring procedures for identifying such hardship situations so that a consistent and responsible approach can be taken. Recent experiences with Indian projects are examples.

The Small Reclamation Projects program has been successful in achieving a number of desirable innovations in water management. Most projects achieve substantial conservation gains over the facilities they replace. Indeed a significant part of the repayment capacity for the irrigation portion is often from water, energy, and other O&M savings. Transfer of water to urban users has been facilitated. Ground water recharge and protection has been a feature of other projects. Innovative and cost-saving technology has been encouraged with some impressive results. The use of roller compacted concrete is a recent dramatic example at the Galesville Project in Douglas County, Oregon. Just as significant is the very frequent cooperation between local entities that the program makes possible. Many projects can be cited where several canal companies have joined together and with neighboring cities in the joint management of their resources. Such comprehensive management approaches have increased self-sufficiency and ability of local people to be independent and productive. Many projects can be cited as examples of the above.

Under the Small Reclamation Projects Act, interest-free loans are intended to assist commercial agricultural production on lands determined to be irrigable and within landholding limitations (nonexcess). Interest is charged annually on those portions of loans associated with the furnishing of irrigation benefits to excess lands; M&I water service; production of commercial hydroelectric power: and the reimbursable portions of fish and wildlife enhancement and public recreation. In addition, the cost of water sevice to nonirrigable lands and small tracts or lands not used for the commericial production of agricultural crops or livestock must be allocated to M&I water supply and be repaid with interest.

Under the current law the interest rate is determined each fiscal year by the Secretary of Treasury in accordance with a formula contained in the Small Reclamation Projects Act and is based upon the computed average interest rate payable on outstanding long-term obligations of the United States. The rate applicable for fiscal year 1985 is 10-7/8 percent. We recommend that the Small Reclamation Projects Act be further amended to change the interest rate formula to reflect the average yield on the outstanding marketable securities of the United States. I am submitting the recommended language with my statment. This formula will reflect the actual cost of borrowing to the U. S. Treasury. During fiscal year 1984 this rate was about 12.38 percent. For comparison, the rate applicable for fiscal year 1985 under the current formula is 10-7/8 percent.

Finally, I would like to comment on the issue of surplus crops. We recommend that the irrigators be given a choice between two options: (1) they could contract to repay the cost associated with the production of surplus crops with interest and participate in farms programs, including the production of surplus crops to the extent the farm programs permitted, or (2) they could repay the loan at the interest-free level and refrain from participation in the farms programs and the production of surplus crops. We will be happy to work with the Committee in developing the language needed to provide for such options.

In summmary, the original purpose of the Small Reclamation Projects program, as authorized by the Congress in 1956, was to enable private water user organizations in the 17 Reclamation States and Hawaii to obtain loans and/or grants for the construction of small projects. This is even more approriate today as we encourage greater non-Federal participation in the planning and construction of water projects. Loans approved under this program permit those private organizations to continue, or to expand their operations with projects they have planned entirely with their resources and only partially financed for construction with Federal funds.

This completes my prepared statement, Mr. Chairman. I would be happy to answer any questions.

Amendment to S. 1171
To modify the interest rate formula contained in
P. L. 84-984

Amend Section 5(c)(2) to read, "interest, as determined by the Secretary of Treasury, as of the beginning of the fiscal year in which the contract is executed, on the basis of the average market yields on outstanding marketable obligations of the United States with remaining periods to maturity comparable to the applicable reimbursement period of the project, adjusted to the nearest one-eighth of one per centum, on that portion of the loan which is attributable to furnishing irrigation benefits in each particular year to land held in private ownership by a qualified recipient, as such term is defined in section 202 of the Reclamation Reform Act of 1982, in excess of 960 irrigable acres, or by a limited recipient, as such term is defined in section 202 of the Reclamation Reform Act of 1982, in excess of 320 irrigable acres;".

Rev. 7/11/85

Statement of Robert N. Broadbent
Assistant Secretary for Water and Science
Witness for the Department of the Interior before the
Subcommittee on Water and Power of the
Senate Committee on Energy and Natural Resources
on S.1192
A Bill to Implement the Coordinated Operation Agreement
for the
California Water Project and Federal Central Valley Project
July 16, 1985

We appreciate the opportunity to be here today to present the views of the Department of the Interior regarding the Coordinated Operation Agreement. That Agreement provides an operating relationship between the two largest water projects in the State of California. Under the Agreement, the operation would be coordinated in such a way that water quality standards established by the State Water Resources Control Board in Decision 1485 for the Sacramento-San Joaquin Delta would be achieved while at the same time meeting the operational goals and objectives of both the Central Valley Project and the State Water Project. The proposed Agreement provides a basis for building consensus around water development issues in the State of California. The formulae established in the agreement provide for an equitable sharing of water resources and recognize water development strategies adopted by both the State and Federal projects.

The long history of water development in the Sacramento-San Joaquin Delta is surrounded by many complex and difficult issues. The water rights in the respective basins (Sacramento and San Joaquin) exceed available water supplies and have never been fully adjudicated. Many permits or rights were secured by the various parties in a period of time when there was no Water Resources Control Board in the State of California and, subsequently, additional water rights were issued by the State Water Rights Board. All of the water rights for the State Water Project and most of the water rights for the Federal Central Valley Project are now regulated by the California Water Resources Control Board in accordance with State law.

The Coordinated Operation Agreement recognizes, through the methodologies and assumptions used in its development, the long-endorsed principle of Western water law or, "first in time--first in right." In the case of the Coordinated Operation Agreement, each project develops its water supply with a priority established by the date it was actually constructed. As a consequence, officials for the two projects have been able to agree to their respective water supplies without actually having to litigate the water rights issue.

The Coordinated Operation Agreement also provides for integration of the two projects operationally to maximize the resources of both projects for the mutual benefit of the State of California and the Nation.

The Coordinated Operation Agreement provides an institutional framework whereby both projects can operate conjunctively in such a way that the State, if it purchases water on an interim basis from the Federal Central Valley Project, can help repay the Federal investment in project works. At the same time, by utilizing surplus conveyance capacity in the State aqueduct, Federal contractors can similarly assist in repaying the capital costs of the California Aqueduct. Making better use of existing facilities is in both the State and the Nation's interest.

Attached to this statement is a summary which explains in further detail the Agreement and history of the State Water Project and Central Valley Project.

In summary, the Coordinated Operation Agreement does a number of things: It enables the projects to conserve water resources; it enables reduction of groundwater overdraft; it fosters protection of environmental values of the Delta, the Bay and the other waters of the State of Califronis. It has an additional advantage of providing more time for future planning to be certain that future water resource development in the State of California can be done in an economically efficient and environmentally sensitive way.

We believe the Coordinated Operation Agreement is a major step in securing water system dependability, environmental protection, and economic stability within the State of California and would encourage its ratification by the Congress.

We appreciate the opportunity to be here before you today and look forward to answering any questions you may have.

Mr. **Brown**. Thank you very much, Mr. Broadbent.

You made reference to water samples bearing selenium that have been discovered in Kern County.

Are those lands in Kern County where the samples were taken, were those Central Valley Project lands or were they State Water Project lands?

Mr. **Broadbent**. Those lands are presently served by water from the State Water Project, and from waters, from appropriated surface waters that they have in the area, but they are not Federal lands.

Mr. **Brown**. So when we are discussing then a selenium problem on the west side of the valley, we are directing our comments towards both the Central Valley Project and the State Water Project.

Mr. **Broadbent**. Yes, I think it's about evenly divided. I think our first problem area was in the Central Valley Project, but I think it's probably about evenly divided, and we're beginning to see that. A good part of the grasslands area has State Water Project water.

Mr. **Brown**. Who is doing the sampling work on lands served by the State Water Project?

Mr. **Broadbent**. At the present time, the broad based program is being done by the Geological Survey.

Phil, you may even want to talk about it a little bit, but it's being done by the Geological Survey, and we're working at the entire west side.

Mr. **Brown**. Is the State also participating on the program for measuring selenium content on the State lands, State-served lands?

Mr. **Broadbent**. The State did the sampling down in the Bakersfield area, which is the area in Kern County, and they are doing some of the other sampling programs.

We have an overall coordinating committee that is a coordinating committee between the State and the Federal Government. That coordinating committee meets regularly to look at the program. The State of California, it's my understanding, has appropriated some money next year for some of these studies. They are looking further at what else they may have to do. We are hopeful that the State not only as being a partner in the study program but will also be a full partner in the financing of the study.

Mr. **Brown**. Well, given the hydrologic and geologic situation that we are dealing in the west side of the San Joaquin Valley, if you have a common problem between the State project and lands of the Central Valley Project, I can't see whether it would be very helpful to fix one without the other or to go off on different programs, one serving the State and one serving Federal lands.

In your opinion, should there be ultimately a single drainage program that would serve both State and Federal lands?

Mr. **Broadbent**. In my opinion, yes, sir.

Mr. **Brown**. Would there be a possibility of perhaps cost saving?

Mr. **Broadbent**. Well, I would hope so. I think that we are going to be able to spend the dollars, and I think we are spending the dollars. We are coordinating the dollars pretty well. The State has just finished their budget, and we just really don't know where they are going to be, and then we just found the selenium down in the Kern County area, and I think that could lead to a lot of new things.

Mr. **Brown**. Well, under section 3 of S. 1157, it provides authority for the Secretary of the Interior to accept contributed funds for the activities that would be authorized under the act.

Is this section necessary in light of the Contributed Funds Act?

Mr. **Broadbent**. Probably not, no, but I think it's put in there just to call attention to the package.

Mr. **Brown**. To call attention to certainly an expressed interest on the part of the department to receive additional funds from non-Federal sources.

Mr. **Broadbent**. And I think it's a joint thing. You know, we funded the State Division of Agriculture to do some looking at selenium in some of the crops out there, too. And so it is kind of a quid pro quo.

Mr. **Brown**. Thank you, Mr. Broadbent.

Senator **Murkowski**. I'm sure that you heard Governor Janklow's comments, that he could not really appreciate or understand why the position of the administration was in opposition to the Hilltop Gray Goose proposal. I don't know whether you've had a chance to specifically respond to that, but for my benefit, I would appreciate it if you would.

Mr. **Broadbent**. Well, Mr. Chairman, we specifically I think held that item until you had an opportunity to return, and I would be glad to comment.

Senator **Murkowski**. Please do.

Mr. **Broadbent**. First of all, I think there is a recognition in Congress certainly by virtue of the Garrison Bill that was passed last year, and I think there is a recognition by the administration about the need to evaluate our commitments as we look at water projects, that——

Senator **Murkowski**. You don't agree that there was a commitment made some time ago by the Federal Government?

Mr. **Broadbent**. Yes; I do, and the commitment was for irrigated agriculture in South Dakota.

Senator **Murkowski**. And has the Federal Government lived up to that commitment in your opinion?

Mr. **Broadbent**. No, sir, it hasn't, but it's not all the fault of the Federal Government. They had a big project there, and that project was called the Oahe Project, and there was construction started, there was maybe $100 million spent, and it was cancelled by the users in that State, by the interests in that State.

Now, there was a terrible battle in the State over it, and it got caught up in a lot of tough politics and was later cancelled.

This administration has recognized the necessity of looking at the water needs of the State of South Dakota. We have funded major studies in South Dakota, one called the Central South Dakota Project, which is called Cendak, a look at Andes Wagner, and we have funded several other studies, but we just felt that we couldn't at this time take a precedent, which we haven't done before, and that is support a change to Pick-Sloan power without further direction and further thought and further consideration of the implications we might be in.

Senator MURKOWSKI. I'm looking at your testimony and you indicate that the two irrigation projects under consideration have been privately developed and have not been examined to determine if they meet Federal criteria for irrigation.

To one who would read that first blush, that's kind of a bureaucratic approach to it.

Mr. BROADBENT. You're right.

Senator MURKOWSKI. And I'm wondering, why hide behind that kind of a——

Mr. BROADBENT. Well, I think we were, if I could, I think we were trying to let it down lightly.

Senator MURKOWSKI. Let it down gradually.

Well, if that's not your real reason. Then you go on to say, "we believe that before any additional irrigation projects are authorized to receive pumping power, an overall evaluation is required" which would lead the reader to again draw the conclusion that you are perpetuating the existence of the consultants in Washington, DC, who go out and put these things together. Eventually somebody makes a decision down the line whether they are going to do something or not.

Mr. BROADBENT. Well, we can disagree.

I think that's the same——

Senator MURKOWSKI. Well, could you tell me then what your real reason for opposing it might be?

Mr. BROADBENT. I'm trying to word this very carefully, Mr. Chairman——

Senator MURKOWSKI. Well, in the interests of full disclosure——

Mr. BROADBENT. I think that basically we have——

Senator MURKOWSKI. Are we opposed, as an administration or government, to private studies?

Mr. BROADBENT. No; sir, I hope not.

Senator MURKOWSKI. OK. Well, then we have ruled that out.

Mr. BROADBENT. But I think we have taken a position in these cases, Belle Forche and all of them, right on down, in opposition to the use of project power without some kind of a study.

I think clearly South Dakota has the right to a certain amount of megawatts, 100-some odd megawatts or whatever it is, for project power. I think that right has to be, in my personal opinion, should be kept, and I think we should look at it on a broad basis in South Dakota and try to reach a comprehensive solution to that problem.

Now, we may not only have these two smaller projects, but we have had other projects that are looking for—we have a 500,000 acre Cendak project that is looking for project pumping power, Lake Andes Wagner, a smaller, 30,000-, 40,000-acre irrigation project that is looking for project power, and I think we need to get down and prioritize them, and I'm certainly—if this is the will of the Congress and they decide that this is their priority, I would guess that this administration certainly isn't going to oppose the bill.

Senator MURKOWSKI. Well, on the other hand, you guys are theoretically the experts, while we represent our constituents. The significance of your testimony in opposition is paramount, and appropriately so, because if it wasn't necessary to have a position from the administration by those who are charged with the responsibility, why, we could do away with a lot of overhead around here. We'd just make decisions, and whether we'd live by them again is something else.

But my point is it seems that you're being most cooperative, and I commend you for it, but let's assume that the point that you raise in your testimony, that of studying the issue, would result that it's in the best interest. Would that induce you to be supportive of the proposal before you?

Mr. BROADBENT. You bet.

Senator MURKOWSKI. Well, how long does a study like this take? As long as you want to make it or——

Mr. BROADBENT. Yes, we could probably stretch it. No, I——

Senator MURKOWSKI. You could stretch it out for some time.

Mr. BROADBENT. He said less than a year. I think that's probably not the kind of answer that we ought to give for the record.

I think—let me get back to you on that, Senator, if I may.

[The information follows:]

The two irrigation projects under consideration for integration into the Pick-Sloan Missouri Basin Program (P-SMBP) have been privately developed. No Federal studies have been conducted to determine the irrigability of the land, financial feasibility and environmental acceptability. We believe that before any additional irrigation projects are authorized to receive pumping power, an ovearall evaluation is required to assure that use of the limited resource is compatible with the ultimate development of the P-SMBP. The Bureau of Reclamation has conducted such an analysis and is preparing a letter report on its findings. We will provide you with a copy of that letter report as soon as it is received.

Senator MURKOWSKI. Do you have the money for a study if you want to go ahead and make a study?

Mr. BROADBENT. We could find the money if that's what it would take.

Senator MURKOWSKI. Good. I see Mr. Atwater shaking his head. You gave me the answer I want to hear.

Mr. BROADBENT. I think we could find the money.

Senator MURKOWSKI. How much does it cost to make a study like this?

Mr. BROADBENT. I can't imagine that what we've listed in this program would take very much.

Senator MURKOWSKI. Mr. Atwater, do you have any comments on how much it would take? You are giving a little advice there with your head.

Mr. ATWATER. Oh, I'd say less than $50,000.

Senator MURKOWSKI. Less than $50,000, and it could be done in less than 1 year. And then you'd have to make a decision whether to support it or not.

Mr. BROADBENT. Yes.

Senator MURKOWSKI. Why—isn't there enough expertise in your area to make a decision on whether you want to support it or not?

Mr. BROADBENT. The process of making it—the thing that bothered me the most——

Senator MURKOWSKI. Why do you have to have a study to make a decision?

Mr. BROADBENT. The decisionmaking process in the bureaucracy isn't the easiest thing to make, as you well know, and going through that, I think Rich or myself or some of the rest of us can make a decision rather easily, but the review process sometimes is rather lengthy and rather protracted and rather tough.

Senator MURKOWSKI. Is it the covering of the rear extremity that concerns the bureaucratic process, and having the study behind him?

Mr. BROADBENT. Well, having been, having somebody look at me, I think that certainly is part of it, but I don't think that's the case here.

Senator MURKOWSKI. I'm just confused with your testimony. It sounds like, you are basically in concurrence with private efforts in this area but the Federal Government hasn't been as responsive as they should have been in living up to commitments that were made. We are down to the question of whether this study is necessary, and you indicate you'd be most cooperative with the will of Congress if we decide to go ahead and include the requirement for the study.

But your opposition doesn't seem to be as strong as I would expect. It's almost as if we dragged this thing on another half hour you might come around to support it.

Mr. BROADBENT. Well, I doubt it, Mr. Chairman, knowing the constraints that are in the system.

Senator MURKOWSKI. Does OMB have anything to do with your decision?

Mr. BROADBENT. The clearance process certainly requires OMB to sign off.

Senator MURKOWSKI. What does OMB say?

Mr. BROADBENT. OMB said the same thing we did.

Senator MURKOWSKI. Have you ever gone against OMB on a recommendation?

Mr. BROADBENT. Me? Not I. Heaven's sakes.

Senator MURKOWSKI. Is it fair to say then OMB really runs things around in your area?

Mr. BROADBENT. I wouldn't say that.

Senator MURKOWSKI. But do you feel very much at ease to tell OMB to go ahead and mind their own business, you're in favor of this?

Mr. BROADBENT. I think they provide the service they need to provide. They are the guys that have to say no.

Senator MURKOWSKI. But this one is no cost, is it not?

Mr. BROADBENT. It is at no cost, but——

Senator MURKOWSKI. If you raise rates, then are you going to lose some revenue?

Mr. BROADBENT. I don't think the rate thing is a big thing.

Senator MURKOWSKI. I don't either. So why is OMB in it?

Mr. BROADBENT. I don't think they are. I said they review it, but it was our recommendation. This was our recommendation to OMB.

Senator MURKOWSKI. Why?

Mr. BROADBENT. It basically is a precedent, I guess.

Senator MURKOWSKI. Well, you know, you make precedents either way.

Mr. BROADBENT. Sure.

Senator MURKOWSKI. Who would you say made the recommendation?

Mr. BROADBENT. On this?

Senator MURKOWSKI. Yes, a committee or one individual?

Mr. BROADBENT. I guess the precedent, which ought to be set by Congress, by the committee.

Senator MURKOWSKI. Who said that you're not for this?

Mr. BROADBENT. Ultimately I did.

Senator MURKOWSKI. I see, and that came out of a recommendation from you or people that you hold accountable, I assume, just as we all do.

Mr. BROADBENT. That's correct.

Senator MURKOWSKI. You are responsible for basically giving to the committee the rationale, and the rationale is simply, well, you didn't have a chance to study it.

Mr. BROADBENT. I guess that's part of it because we don't know, and I think it was better said in a little longer testimony that was given by Western Area Power and is submitted for the record, and I would suggest that maybe that indicates some of the problems that are inherent in it, in the power part of it.

Now, our testimony is soft and cuddly, I admit that, and it was meant to be that way. It was a no, but not a very strong no.

Senator MURKOWSKI. I noticed that.

I've got to go vote.

I would ask that Mr. Brown proceed.

Mr. BROWN. These questions certainly are for the record, Mr. Broadbent.

Mr. BROADBENT. I'm certainly ready right now.

Mr. BROWN. You know, in reviewing the history of the reclamation program, I think there were a lot of early project authorizations that did in fact include private or certainly non-Federal irrigation developments as part of the Federal reclamation project.

I recall the Yakima projects in Washington, Mann Creek in Idaho, Red River basin in Oregon and so on. There have been a great many non-Federal developments which were subsequently made part of the Federal Program by Act of Congress.

So to that extent, picking up Hilltop and Gray Goose as units of Pick-Sloan Missouri Basin Program I do not think would be considered a precedent. You also stated that certainly there have been no Federal studies conducted as to the irrigability of these lands. However, I would note that the developments themselves were financed by loans furnished from the Farmers Home Administration, and Farmers Home, just like any other lending entity, wants to make sure that their funds are going to be used for a feasible project.

Are you familiar with the loan process by Farmers Home Administration?

Mr. BROADBENT. No, sir, I'm not. I think what we meant is there has been no study under the Reclamation Program or reclamation law. I certainly recognize if there were loans made by Farmers Home or by USDA or anybody else, certainly they went through their procedures.

Mr. BROWN. So to that extent, then, if the Department was requested to examine Hilltop and Gray Goose, there would in fact be a body of factual material that they could review as to soil types, climate and so on that had previously been assembled either by the Department of Agriculture or perhaps private engineering consultants, probably then very little field work would be required on the part of the Department. It would be a review primarily then of existing materials that had been submitted to Farmers Home.

This perhaps then wouldn't take quite as long as a year.

Mr. **Broadbent**. I don't think it would take long. We have studied South Dakota just about from border to border.

Mr. **Brown**. Yes; we have moved the Oahe project around to at least 12 different locations that I know of.

In follow-up then to the comment on pumping power as a limited resource, I believe that Governor Janklow mentioned that there was over 100 megawatts, or perhaps 170 megawatts of Pick-Sloan power that was certainly envisioned as being available to the State of South Dakota for irrigation pumping purposes.

Testimony I think given also by the Governor indicated that Hilltop-Gray Goose would require about maybe 5 or 5½ megawatts out of that possibly 170. It would appear that this is a rather small amount of power as far as the overall availability is concerned. Even with Lake Andes Wagner and development of CENDAK, it would appear that there would be adequate power supplies available certainly to include Hilltop and Gray Goose.

In that regard, would the Bureau be ready to submit to the committee an estimate of Pick-Sloan suballocated costs that would be the responsibility for repayment by Hilltop and Gray-Goose should this legislation be enacted?

Mr. **Broadbent**. Sure.

[The information follows:]

The information requested regarding the irrigation districts' responsibility for repayment also has been covered in the letter report prepared by the Bureau and will be provided to you as soon as it is received.

Mr. **Brown**. Very good. Thank you.

In the absence of Chairman Murkowski, we will proceed to the next bill on the agenda. Of course, you will certainly be free to come back and discuss Hilltop and Gray Goose with the chairman as long as you wish or as long as he wishes.

Mr. **Broadbent**. Do you think we are through with 1157?

Mr. **Brown**. Well, I do have some questions on that one as well, and if you would like me just to——

Mr. **Broadbent**. I know that Senator Wilson came in. I wonder if you would like him to make his statement or wait until the chairman comes back. I certainly would be glad to relinquish our place here and let the Senator go ahead with his statement.

Mr. **Brown**. Oh, very good.

He disappeared. You are back.

Mr. **Broadbent**. If he comes back in, certainly we would be happy to——

Mr. **Brown**. I do have some questions on S. 1157. You had completed your statement on the San Luis drain bill.

Would you please explain the difference between the two repayment mechanisms as provided in section 2 of the bill? We include both 9(d) and 9(e) contracts, or at least the authority for the Secretary to secure repayment, whether 9(d) or 9(e).

What would be the difference?

Mr. **Broadbent**. Well, do you want to answer that, Rich?

Mr. **Atwater**. Sure.

Mr. Brown, basically under existing contracts, where we have water service contracts, assuming that we would not be able to negotiate a no repayment contract, we pay for the studies and the implementation of the solution for the San Joaquin Drainage Program, we could roll over the repayment in the existing water service contract, so we would provide the authority so we could utilize both 9(d) or 9(e).

Mr. **Brown**. Now, some of those water service contracts are for areas of the Central Valley project that do not contribute to the Kesterson selenium problem.

Mr. **Atwater**. That is correct.

Mr. **Brown**. Would you try to target those water areas or those irrigated areas which actually contribute to the problem as being those areas which would pay——

Mr. **Atwater**. Well, the irrigation rates are kind of a postage stamp type rate. There is a distinguishing between the Sacramento Valley and the San Joaquin Valley. In this case it would probably be limited to the San Luis unit service area.

Mr. **Broadbent**. If possible, I think we would like to sign a contract with the directly-affected people, but certainly if we can't, it would become a general project cost, and it would be our intention that it would become a general project cost for the Central Valley project and would be paid for under the 9(e) contracts.

Mr. **Brown**. So under any circumstance, given the requirements of this legislation, the funds authorized and appropriate would be in fact repaid to the Federal Government?

Mr. **Broadbent**. Unless we are given different direction by the committee. Unless there is different legislation. But it would be our intention to get repayment. We would rather get project specific repayment from those specific areas that are benefitted, but if we are unable to do it, and in some cases we may be unable to force a contract to be signed, and it would be our intention that it be paid for as part of the Central Valley project cost on a 9(e) contract.

Mr. **Brown**. Testimony today on S. 1157 has concentrated on the study aspects, but the legislation also authorizes the Secretary to construct interim corrective measures.

Do you have any idea at this time what those construction activities would consist of?

Mr. **Atwater**. Yes. We included as a part of the backup references exhibits to our testimony the State Water Resources Control Board cleanup and abatement plan that we submitted to the State board on July 5, and in that we have proposed cleanup plan for the Kesterson Reservoir, which is in the range of about $2½ million to $3½ million with contingency plans upwards of almost $200 million. What we intended by the proposed legislation was to allow the interim measures to immediately begin the cleanup program at Kesterson Reservoir, but with the understanding that we would have to come back for full authorization for that cleanup program, so in the next few months we could initiate that since we do have a very tight timeframe.

Mr. **Brown**. When do you anticipate knowing if you are going to come back to the Congress for further authorization and appropriation?

Mr. **Atwater**. Let me just describe the logistical, procedural morasse that we are in with the Kesterson cleanup plan. We submitted that cleanup plan on July 5 with the State Water Resources Control Board who, of course, under State law, and also under the Clean Water Act, has to review and either approve or provide conditions to that plan.

Well, given a range of dollars from about $3 million up to $200 million, we would not like to come to Congress today and say, well, we only need $3½ million when in theory the State board could require us to do the full, worst case, if you would, cleanup, which would require the disposal of a big cost ingredient, which is the sediments, to a class I disposal site, which gets you up to the range of $200 million.

So what we would propose to do is submit that legislation after we get approval by the State board of what precisely we are going to be required to do, and that would probably be, we would expect, in the next 60 to 90 days.

Mr. **Broadbent**. In addition to that, I think our testimony says that in the study plan that is going on, we have requested $12 million plus for next year, but we also recognize that there is going to be a full evaluation by the National Academy, and they may want to look or change or modify the priorities, and I think that it would be our intention to bring back that plan. I think we indicated that we would hope to, after it had had full review by the National Academy, would put it into a proposal that would indicate long term, our long term commitments.

Mr. **Atwater**. I would just also add one footnote. We also need to comply with the National Environmental Policy Act and prepare a full environmental impact statement on the cleanup plan. That will take, from this month, probably an additional 12 months to complete that process. And of course, out of that process, mitigation measures or other things may come out which would provide additional costs.

There is one endangered plant in the Kesterson area that needs to be considered, for example.

Mr. **Brown**. Well, of the money that would be authorized under S. 1157, do you have an approximation as to how much money would go for the three agencies here at the table?

Mr. **Broadbent**. Yes.

Mr. **Atwater**. Yes; I think we did supply that for the record, but just approximately.

Mr. **Brown**. It is fine if you want to supply it for the record.

Mr. **Atwater**. We will supply the tables for that budget.

Mr. **Broadbent**. The tables were supplied as part of the backup. In fact, the complete study plan was supplied.

Mr. **Brown**. There were rather voluminous submissions for the record.

Mr. **Broadbent**. I think it's in our testimony. I think it is directly in our testimony, if I'm not wrong.

Mr. **Brown**. Well, we have another question.

Mr. **Broadbent**. The study plan, what we are going to spend the $12 million for? I think it is about $4 million for Fish and Wildlife Service, $3 million for U.S. Geological Survey, and the balance for reclamation; and we would be glad to furnish to you the complete study plan for the record.

[The information follows:]

Enclosed are copies of the draft study and work plans for the San Joaquin Valley Drainage Program:

1. "San Joaquin Valley Drainage Program—Plan of Work—Overview," draft dated June 28, 1985.

2. "San Joaquin Valley Drainage Program—Plan of Work," draft dated July 19, 1985.

These draft study and work plans, including specific research proposals, are currently being reviewed by the Interagency Technical Coordinating Committee and the National Academy of Sciences/National Research Council Committee on Irrigation-Induced Water Quality Problems. We expect that the draft study and work plans and the related budget estimates will be revised during the next 2 to 6 weeks, after we receive comments and recommendations from the above committees.

Draft-June 28, 1985

SAN JOAQUIN VALLEY DRAINAGE PROGRAM

PLAN OF STUDY

OVERVIEW

Office of the San Joaquin Valley Drainage Program

U.S. Department of the Interior
- Bureau of Reclamation
- Fish and Wildlife Service
- Geological Survey

The Health and Welfare Agency of California
- Department of Health Services

The Resources Agency of California
- Department of Water Resources
- Department of Fish and Game

July 1985

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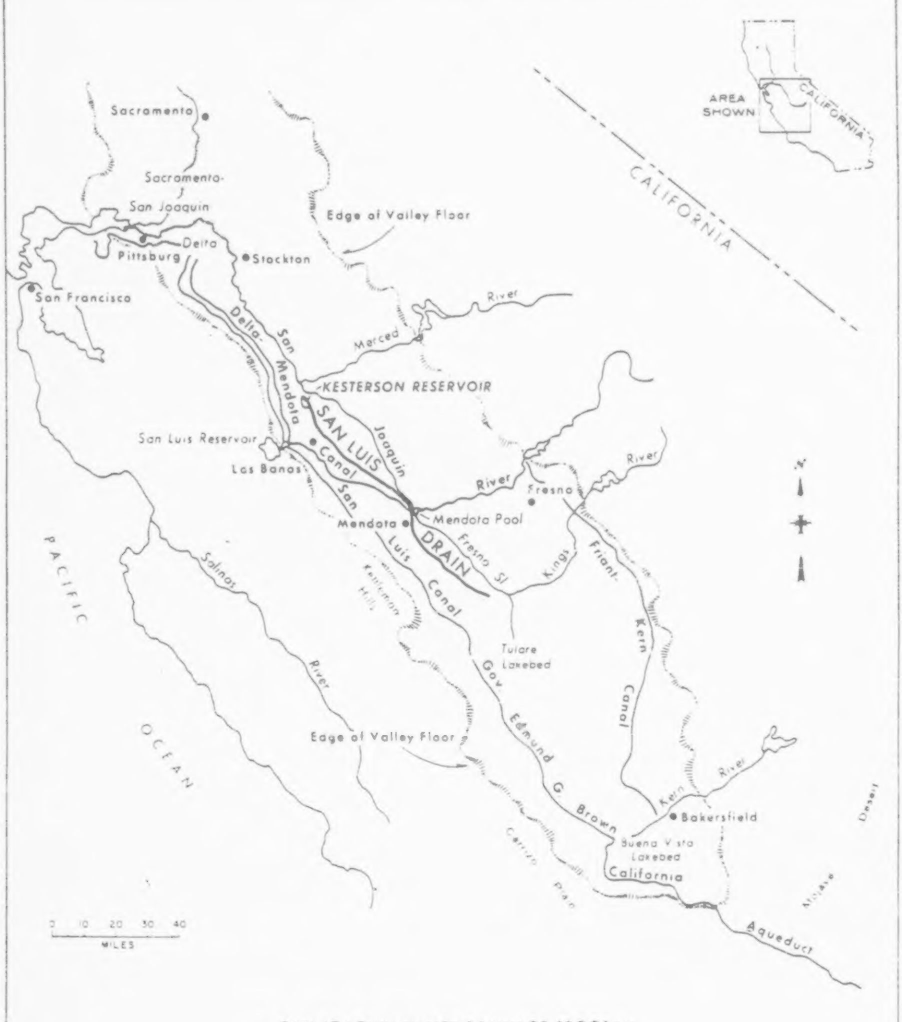
INTRODUCTION

PROBLEMS AND PURPOSE

Subsurface agricultural drainage waters on the west side of the San Joaquin Valley are causing adverse impacts on agricultural production, fish and wildlife and their habitats, and surface- and ground-water quality. A comprehensive strategy to manage these drainage waters in an economically, environmentally, and socially acceptable way has yet to be developed.

Management of the key resources of the San Joaquin Valley (see Figure 1)--agricultural lands; fish and wildlife and their habitats; surface- and ground-water quality and quantity in general, and more specifically, the San Joaquin River and the San Francisco Bay-Delta--involves some basic conflicting needs. At issue are municipal, industrial, and agricultural needs for dependable supplies of high quality water and a means to dispose of poorer quality drainage water. Yet, of equal significance, are the requirements of high quality water for fish and wildlife habitat and maintenance of surface- and ground-water quality and quantity which can be affected by agricultural drainage activities.

The purpose of the San Joaquin Valley Drainage Program is to identify and evaluate alternative resource management and development proposals which address this complex issue of agricultural drainage within the western San Joaquin Valley. Specifically, the study will develop technical, financial, legal, institutional, and environmental management actions which can be combined in various ways to protect


AREA SHOWN
CALIFORNIA
CALIFORNIA
Sacramento
Sacramento-San Joaquin
Delta
Pittsburg
Stockton
San Francisco
Edge of Valley Floor
Merced
River
Delta-Mendota
San
Joaquin
KESTERSON RESERVOIR
SAN LUIS
DRAIN
Canal
San Luis Reservoir
Los Banos
San Luis Canal
River
Fresno
River
Mendota
Mendota Pool
Fresno Sl
Kings
Friant-Kern Canal
Kettleman Hills
Tulare Lakebed
PACIFIC
OCEAN
Salinas
River
Edge of Valley Floor
Gov Edmund G Brown
California
Aqueduct
Kern River
Bakersfield
Buena Vista Lakebed
Carrizo Plain
Mojave
Desert
N
0 10 20 30 40
MILES

SAN JOAQUIN VALLEY DRAINAGE PROGRAM

STUDY AREA LOCATION

FIGURE I

public health and water quality and enhance and protect fish and wildlife, and their habitats, and agricultural land and productivity. Any ecosystems, social structures, or economies affected by alternatives will be identified and impacts will be described and their significance evaluated. The overall work plan contained herein is directed toward development of an economical, environmentally sound, and publicly acceptable solution to the agricultural drainage problem.

The problems under consideration in the San Joaquin Valley Drainage Program are interrelated subjects. These drainage-related problems associated with irrigated agriculture on the west side of the San Joaquin Valley are:

- land degradation through poor drainage and salt accumulation
- degradation of surface and ground water
- degradation and loss of fish, ~~and~~ wildlife, AND THEIR habitats
- potential risks to human health
- continued impacts to the existing economic and social characteristics

BACKGROUND

The San Joaquin Valley, particularly the western part, is presently one of the most important agricultural areas of the United States and the world in terms of crop value and diversity. The valley also contains key wintering areas for migratory birds of the Pacific Flyway, the populations of which now appear to be limited by, among other factors, the availability of wetland habitat.

The San Joaquin River, the natural drainage outlet for the valley, is extensively developed and regulated. It receives large volumes of agricultural drainage and runoff which eventually reach the San Joaquin-Sacramento Delta and San Francisco Bay. Historically, the San Joaquin River System supported populations of both fall run and spring run chinook salmon. Water diversion projects which have sustained great agricultural, municipal, and industrial benefits have not been without severe environmental costs--significantly impacting these salmon populations. For example, agricultural development has resulted in the reduction of some populations of chinook salmon and total elimination of the spring run in all tributaries and the spring and fall run in the main stem.

In addition to local and imported surface water, the San Joaquin Valley is underlain by extensive ground-water aquifers which are heavily used for irrigation, municipal, and industrial uses. Overdraft and land subsidence have occurred in some areas.

Historically, the San Joaquin Valley was a productive and biologically diverse area including grassland, woodland, marshland, vernal pools, riparian and alkali sink habitats. Expansive wetlands extended in a nearly continuous strip along the valley floor, their areal extent expanded and contracted in response to seasonal flooding and drought.

California originally contained an estimated 5 million acres of wetlands, approximately 4 million of which occurred in the Central Valley. To date, approximately 91 percent of the State total and

96 percent of the Central Valley wetlands have been converted to other uses. Most of the wetlands have been eliminated by irrigated agricultural development.

In the San Joaquin Valley, as well as the rest of the Central Valley, the conversion of the biologically rich and productive wetlands to farmlands has created a cornucopia of agricultural products but at the expense of critical wintering habitat for migratory birds of the Pacific Flyway. Wetland conversion has reached a point where wintering habitat may be the single most important factor limiting populations of some species of migratory birds of the Pacific Flyway.

The remaining wetlands of the San Joaquin Valley are of utmost importance to wildlife, especially migratory birds. Mid-September waterfowl counts in the valley reveal that 12 percent of the Pacific Flyway's pintails, one-fifth of its mallards, and half of the other unclassified species are in this area. The Tulare Lake Basin, located in the southern portion of the San Joaquin Valley, supports an average of 40 percent of the pintails of the Central Valley. In addition, these wetlands support the endangered Aleutian Canada goose and other migratory birds, including shore and wading birds that pause there during migration.

Laboratory analyses in 1982 found high selenium concentrations in fish taken from the San Luis Drain and Kesterson Reservoir. In 1983, waterfowl in the reservoir were found to have high selenium tissue concentrations. Deaths, deformities, and significantly reduced reproductive success were observed. Additional sampling in 1984 in the

Grasslands (the largest remaining contiguous tract of wetland acreage in the Central Valley) revealed elevated levels of selenium in some fish and bird species.

Agriculture has its drainage-related problems as well. To maintain agricultural productivity in the west side of the San Joaquin Valley, salt must be continually flushed out of the root zone (leached) with water to maintain a level of salinity that plants can tolerate. Problems are also occurring in parts of the valley's west side where high brackish water tables exist within crop root zones.

Along with the salts, other natural trace elements in the soil also leach into drainage water. Selenium, which has recently gained wide public attention, is a naturally occurring trace element found in the western San Joaquin Valley Panoche Fan geologic formation and other locations in the Valley (see Figure 2). Selenium has been found in elevated concentrations in the subsurface drainage water which comes from this area. As well as causing malformation and death of birds in the San Joaquin Valley, selenium could potentially pose human health problems as well. Concern has been raised over potential harmful effects of ingesting fish and wildlife taken from this area.

Monitoring programs conducted to date have characterized water quality conditions in the San Luis Drain, San Joaquin River, canals, Kesterson Reservoir, Volta Wildlife Area, and shallow ground water in the San Luis Drain service area. To date, these monitoring programs have not determined temporal changes in water quality and have not quantified pollutant loads. The U.S. Geological Survey (USGS), in its synoptic

SAN JOAQUIN VALLEY DRAINAGE INVESTIGATIONS
LOCATION MAP

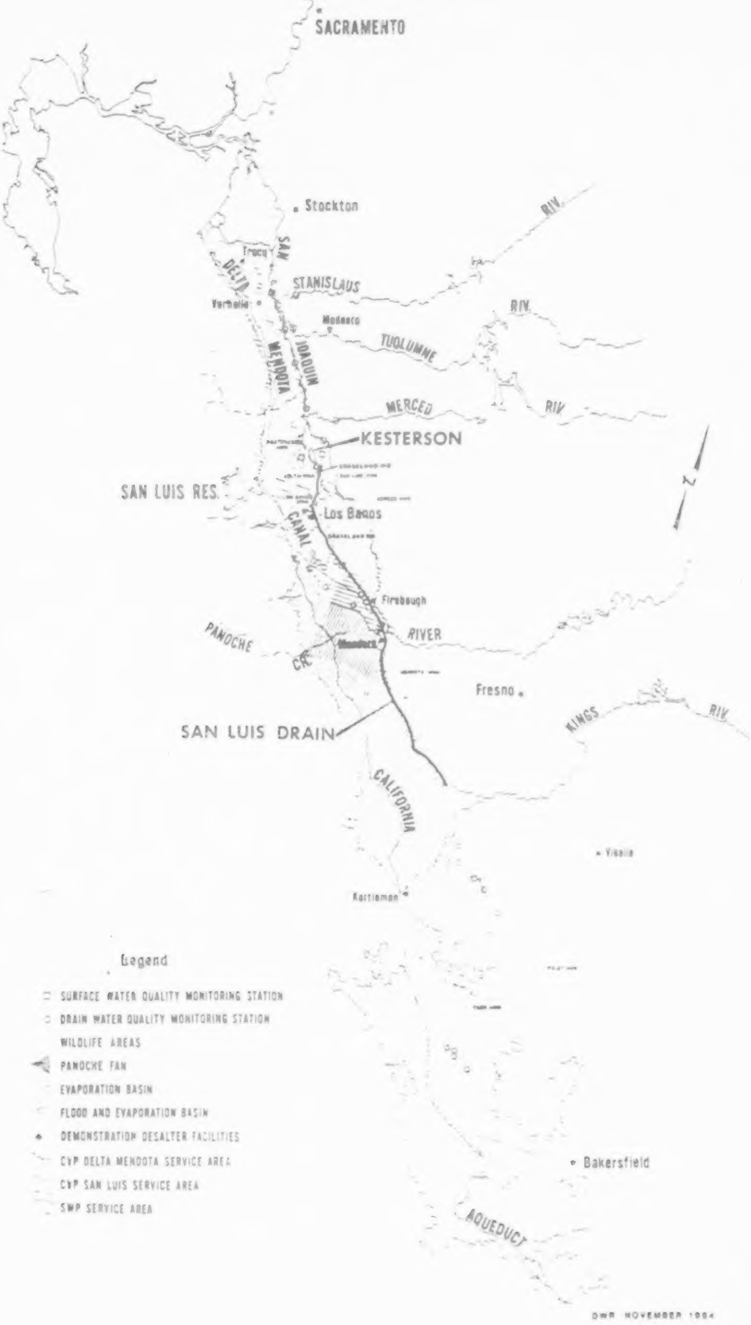

SACRAMENTO
Stockton
RIV.
Tracy
SAN
DELTA
STANISLAUS
Vernalis
Modesto
RIV.
TUOLUMNE
MENDOTA
JOAQUIN
MERCED
RIV.
KESTERSON
N
SAN LUIS RES.
Los Banos
CANAL
Firebaugh
PANOCHE
CR.
Mendota
RIVER
Fresno
KINGS
RIV.
SAN LUIS DRAIN
CALIFORNIA
Visalia
Kettleman
Bakersfield
AQUEDUCT
Legend
SURFACE WATER QUALITY MONITORING STATION
DRAIN WATER QUALITY MONITORING STATION
WILDLIFE AREAS
PANOCHE FAN
EVAPORATION BASIN
FLOOD AND EVAPORATION BASIN
DEMONSTRATION DESALTER FACILITIES
CVP DELTA MENDOTA SERVICE AREA
CVP SAN LUIS SERVICE AREA
SWP SERVICE AREA
DWR NOVEMBER 1984

Figure 7

surveys of drainage and shallow ground water in the western San Joaquin Valley, has identified selenium, mercury, chromium, boron, and nickel as principal constituents of concern. Other studies have also identified soluble organics to be present in drainage waters. Soluble organics may also prove to be a major concern especially if allowed to contaminate ground-water aquifers which are used for public drinking water supplies.

The following overview of the study plan describes the conceptual approach to investigating and resolving the agricultural drainage problems of the San Joaquin Valley.

GOAL AND OBJECTIVES

Goal

The goal of the San Joaquin Valley Drainage Program is to develop a comprehensive action plan which will provide a long-term resolution to the problems associated with subsurface agricultural drainage water generated on the west side of the San Joaquin Valley. Development of the plan requires an evaluation of the economic impacts of the drainage problem, methods of developing safe, practical drainage water disposal options and other alternatives, and further information on trace elements and other components in subsurface drainage waters:

- Where, how, and at what concentrations they enter the drainage system.
- Transport and immobility characteristics.
- Effects of various concentations on fish, wildlife, and public health.

- Potential technical and institutional methods of reducing concentrations to environmentally safe levels or elimination.

Objectives

Program objectives have been developed for the key issues related to agricultural drainage in the San Joaquin Valley. The objectives are measurable and will serve as important benchmarks against which proposed alternative plans will be evaluated. The preferred plan will be the one which best achieves the objectives.

Public health.

- Ensure that public health standards are met.
- Ensure that all potential public health risks are minimized.

Fish, wildlife and their habitat.

- Ensure that existing fish and wildlife resources of the study area are protected.
- Restore and mitigate to the maximum extent practicable for fish and wildlife resources damaged by agricultural drainage originating within the study area.
- Identify and recommend for implementation all reasonable opportunities to enhance beyond restoration and mitigation fish and wildlife habitat to help achieve population, public use, and habitat objectives for fish and wildlife resources of the study area.

Agricultural productivity and lands.

- To the maximum extent practicable, ensure the long-term protection and productivity of farmland in the study area.

Water quality and quantity.

- Identify areas where reasonable and beneficial uses of surface and ground water have been degraded due to agricultural drainage activities.
- Ensure that existing and future ~~reasonable~~ reasonable and beneficial uses of surface and ground water are not further diminished by agricultural drainage or by related activities within the study area.
- Restore to the maximum extent practicable the quality of the surface- and ground-water resources impacted by agricultural drainage originating within the study area.
- Supply to the maximum extent practicable the quality and quantity of instream flows necessary to protect reasonable and beneficial uses as required by aquatic biota.

Financial concerns.

- Ensure that major beneficiaries of alternative plans are identified.
- Identify the nature and degree of State, local and Federal governmental financial participation.
- Develop equitable cost allocations and cost-sharing arrangements.
- Identify opportunities for and impacts of establishing private incentives for implementing alternative plans.
- Identify impacts on repayment obligations for existing water project facilities.

Economic concerns.

- Ensure that alternative plans result in benefits and positive accomplishments for the public at the least cost in terms of resources utilized in and opportunities excluded by implementing the plan.
- Ensure that, where practicable, values of all resources involved in the plan are identified.

Public acceptance.

- Ensure that interested and affected publics are kept informed and are provided adequate opportunities to participate in the plan formulation process.
- Ensure that public acceptability of the preferred plan is clearly demonstrated.

Social impacts.

- Ensure that the social and community effects (employment, community vitality, quality of life) of alternative plans are clearly identified.
- Identify and recommend for implementation all reasonable opportunities to mitigate adverse social impacts of alternative plans.

STUDY AREA

The general study area includes the complete watershed of the San Joaquin River including the Tulare Lake Basin. At present, the primary study area is the western San Joaquin Valley. Of particular concern is the agricultural drainage source area on the west side of the San Joaquin Valley. The drainage source area is shown on Figure 2 and centers around the Federal San Luis Unit and Delta-Mendota Canal service areas of the Central Valley Project (CVP) and the agricultural lands farther south which are served by the State Water Project (SWP) or local developments. Other areas pertinent to the study include potential areas used for drainage transport, disposal, or reuse. These could include the San Francisco Bay-Delta Estuary, the Pacific Ocean, Central California Coastal Zone, the Carrizo Plain, the Mojave Desert, Kettleman Hills, and the Tulare Lake Basin (see Figure 1).

AUTHORITY

To date, the authority for this investigation comes from the San Luis Unit Authorizing Act of June 3, 1960 (P.L. 86-488), and P.L. 96-375 (October 3, 1980) which anticipated that the Bureau of Reclamation would construct facilities to provide drainage service to those areas receiving a water supply from the Central Valley Project's San Luis Unit.

The San Luis Unit Authorizing Act also provides funding authority for drainage implementation studies. This authority is too limiting for the purposes of the San Joaquin Valley Drainage Program. Thus, additional legislation is required to fulfil the objectives of this work plan.

PLAN FORMULATION

OVERVIEW

The planning process for the San Joaquin Drainage Program will consist of a series of steps that begins by identifying problems and opportunities and culminates in the recommendation of a preferred action plan which best achieves the objectives and goal of the study. The purpose of this process is to develop a preferred plan. The process involves an orderly, systematic, and multidisciplinary approach to making determinations and decisions at each step so that the public, resource agencies, and governmental decisionmakers can be fully aware of: basic assumptions and methodology employed; the data and information analyzed; areas of risk and uncertainty; reasons and rationales used; and significant implications of each alternative resource management and development proposal.

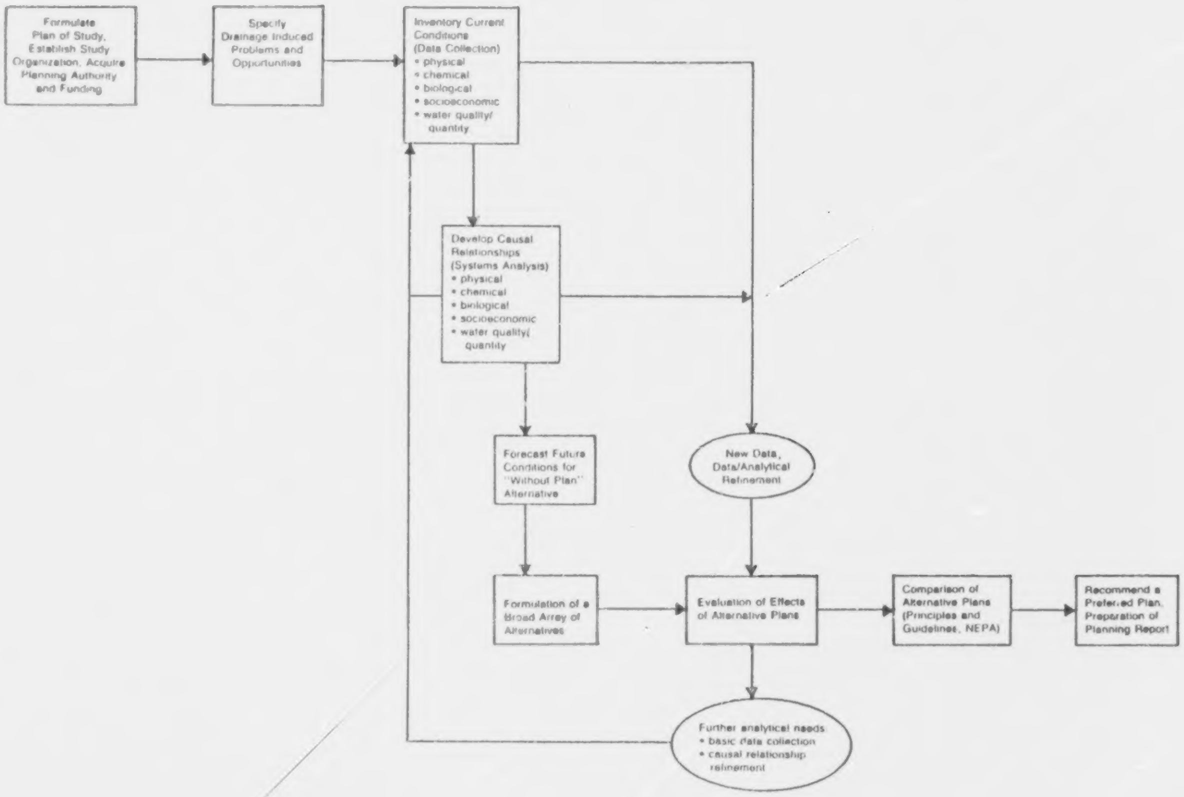
Plan formulation is an iterative, dynamic process. Maintaining flexibility and re-examining previous steps tends to sharpen the planning focus or change its emphasis as new data are obtained or as the specification of problems or opportunities change or become more clearly defined.

The planning process consists of the following six major steps (see Figure 3):

1. Problem Definition. The drainage-induced water quality, biological, and land resources problems of the study area and opportunities for corrective actions which achieve the goal and

Figure 3

Plan Formulation and Recommendation Process


Formulate Plan of Study, Establish Study Organization, Acquire Planning Authority and Funding
Specify Drainage Induced Problems and Opportunities
Inventory Current Conditions (Data Collection)
• physical
• chemical
• biological
• socioeconomic
• water quality/ quantity
Develop Causal Relationships (Systems Analysis)
• physical
• chemical
• biological
• socioeconomic
• water quality/ quantity
Forecast Future Conditions for "Without Plan" Alternative
New Data, Data/Analytical Refinement
Formulation of a Broad Array of Alternatives
Evaluation of Effects of Alternative Plans
Comparison of Alternative Plans (Principles and Guidelines, NEPA)
Recommend a Preferred Plan, Preparation of Planning Report
Further analytical needs
• basic data collection
• causal relationship refinement

objectives of the study will be defined as clearly as current information allows. This information is, by nature, more general than later analyses will supply and relies on previous research.

2. Inventory. The physical, chemical, biological, socioeconomic, and water quality parameters of the study area will be inventoried and analyzed. The effects of current and alternative future resource activities on these parameters will be determined. The forecasting component of this step actually occurs concurrently with Step (3) Formulation of Alternative Plans.

Step (2) includes data collection designed to describe the current physical, chemical, biological, socioeconomic, and water quality conditions presently occurring within the study area.

In order to forecast future conditions resulting from alternative plans, this step also includes the identification of causal relationships between physical, chemical, biological, socioeconomic, and water quality parameters over geographic locations, within sociocultural frameworks, and through time.

Additionally, this step sharpens the focus on and prioritizes the key issues needing resolution, and develops criteria (measurable and quantifiable where possible) to be used in evaluating and comparing the effectiveness of alternative management plans.

3. Formulation of Alternative Plans. During this step of the planning process, a broad array of alternatives will be identified. Through a "screening process," those alternatives, which demonstrate the potential to achieve the study objectives will be selected for evaluation.
4. Evaluation of the Effects of the Alternative Plans. This step is actually an iterative process which involves assessing the impacts of various alternative plans on the physical, chemical, biological, socioeconomic, water quality, and other characteristics of the study area. During this step, alternatives can be modified to better satisfy the study program objectives.
5. Comparison of Alternative Plans. This step includes, but is not limited to, development of the four accounts suggested in Economic and Environmental Principles and Guidelines for Water Related Land Resources Implementation Studies established pursuant to the Water Resources Planning Act. The four accounts facilitate evaluation and display of the effects of alternative plans.

   These accounts are: National economic development (NED), environmental quality (EQ), regional economic development (RED), and other social effects (OSE). These four accounts encompass significant effects of a plan on the human environment as required by the National Environmental Policy Act of 1969 (NEPA) (42 U.S.C. 4321 et seq.). They also encompass social well-being as required by Section 122 of the Flood Control Act of 1970

(Pub. L. 91-611, 84 Stat. 1823). The EQ account shows effects on ecological, cultural, and aesthetic attributes of significant natural and cultural resources that cannot, using state-of-the-art methodology, be measured in monetary terms. The OSE account shows urban and community impacts and effects on life, health and safety. The NED account shows effects on the national economy. The RED account shows the regional incidence of NED effects, income transfers, and employment effects.

6. Plan Recommendation. Recommendation of a preferred plan of action is based upon the comparison of alternatives.

Approaches to Developing Alternatives and Screening

Potential salt and related land and water management alternatives are generally categorized in several ways. One focuses on the origins of the problems and emphasizes avoiding or minimizing the production of salt- and trace element-laden drainage effluent by improving onfarm land and water management practices, altering cropping patterns and irrigation practices, and retiring land from irrigated agriculture in part or altogether, and allowing institutional alternatives such as water transfers, project reauthorization, and water and drainage effluent pricing. A second approach concentrates on treatment of the drainage effluent which includes the disposal or reuse of it once it has been produced as a byproduct of irrigated agriculture. More specific examples of the two general categories are summarized in Table 1.

In order to evaluate each alternative, existing conditions in the service area will be described. Expected future conditions with and without the alternative plan will be described and analyzed.

The four criteria--completeness, effectiveness, efficiency, and acceptability--will be applied to each alternative plan and provide a basis for plan evaluation and selection. The first criterion, completeness, is the extent to which an alternative plan provides and accounts for all investments and actions to ensure full realization of the planning objectives of the study program. Effectiveness means the extent to which an alternative plan contributes to the planning objectives--alleviating specified problems and achieving specified opportunities. Efficiency is the extent to which an alternative plan is the most cost-effective means of achieving the specified planning objectives consistent with protecting the Nation's environment. The fourth criterion, acceptability, refers to workability and viability of the alternative plan with respect to acceptance by State and local entities and the public and compatibility with existing laws, regulations and public policies.

PUBLIC INVOLVEMENT

The purpose of public involvement is to provide an opportunity for interested and affected publics to acquire information about the research and data collection process, and to participate in decisionmaking so as to produce a credible solution that is socially, environmentally, economically, and politically acceptable. It accomplishes these ends through identifying public concerns and values, sharing information, and inviting participation among the concerned publics and agencies.

The basic objectives of the public involvement plan for the San Joaquin Valley Drainage Program are to:

TABLE I

EXAMPLES OF SALT AND RELATED LAND MANAGEMENT ALTERNATIVES

I. Origins of Drainage Effluent

  A. Onfarm management schemes

    1. irrigation efficiencies
    2. alteration of cropping patterns
    3. dry farming
    4. land retirement

  B. Institutional alternatives

    1. water transfers
    2. water pricing
    3. project reauthorization to allocate to other than agricultural uses
    4. drainage effluent pricing

II. Drainage Treatment, Disposal, Reuse

  A. Physical-chemical

    1. precipitation and settling
    2. ion exchange

  B. Desalinization

    1. reverse osmosis
    2. thermal distillation
    3. evaporation

  C. Biological

    1. algal ponds
    2. fixed film media (anaerobic)
    3. silviculture
    4. aquaculture

  D. Land Disposal

    1. evaporative ponds
    2. deep well injection

  E. River Discharge

  F. Estuarine Discharge

  G. Ocean Discharge

  H. Reuse

    1. powerplant cooling
    2. salt reclamation

  I. Others

- Keep the public informed of the nature of the planning process and the mechanisms through which decisionmaking is accomplished.
- Convey technical information acquired during the conduct of the studies to enable the public to make informed judgments about proposed alternative plans.
- Encourage participation in and enable public views to guide the identification and recommendation of alternative plans.
- Identify needs for mitigation of adverse social impacts of alternative plans.
- Provide a vehicle that enables the public to develop Government sensitivity to their concerns and provide a public forum which records those concerns and Government's responses.

Since the concerns of the public will vary at different stages of the study process, public involvement will be an ongoing process throughout the study period. Regular information and communication flow is a key element, necessitating the scheduling of activities.

Therefore, the public involvement plan will schedule work activities to:

- Prepare a series of information bulletins and other information materials to increase public understanding prior to workshops and meetings. A newsletter published periodically will be used to maintain information flow.
- Convene workshops for publics prior to key decision points in the study process.

- Create a Citizens Advisory Committee to enable a relatively small number of people representing a broad range of public interests to work continually with the interagency study team.

ORGANIZATION OVERSIGHT, ENVIRONMENTAL EVALUATIONS, AND PREPARATION OF PLANNING REPORT

A multiagency study team composed of State and Federal agencies will lead or conduct scientific studies in geochemistry, hydrology, microbiology, treatment, and fish and wildlife toxicity. Additionally, the study team will administer studies in sociology and agricultural and resource economics and development of the systems analysis for evaluating the affects of alternative plans. Careful planning and timing are required for these activities so that corrections to the plan formulation and the environmental impact assessment can be made where warranted as the results of these and other studies become available.

The complete report package will consist of a planning report and environmental impact statements (EIS). The EIS will be prepared and will satisfy requirements of the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA), Clean Water Act, Endangered Species Act, Wetlands and Floodplain Executive Orders, and the Fish and Wildlife Coordination Act. Both the planning report and environmental statement for this study will use the recommended format for Integrated Feasibility Reports/ Environmental Statements contained in U.S. Bureau of Reclamation Planning Instructions No. 82-08. All technical reports from the studies will be cited in the main planning report and published as separate appendices.

PLAN OF WORK, SCHEDULE, AND PROCESSING PROCEDURES

A plan of work which will detail specific issues, methodological approaches, budget, and expected output will be prepared to cover all study activities as described in the Plan Formulation section. The Plan of Work will be appended as a part of this Plan of Study. A critical path network will be prepared to specifically focus on the schedule and linkages of activities in detail. The Plan of Work will identify specific research activities including those of the Geological Survey, the Fish and Wildlife Service, and the Bureau of Reclamation. The objective of these research activities is to develop an integrated plan for solving the drainage-related problems in the San Joaquin Valley.

It is proposed that the draft of the comprehensive planning report and environmental statement would be completed in December 1988. Following the internal and public review and revision processes, the final planning report and environmental statement could be completed by December 1989.

BUDGET

To date, budget allocations for activities have been determined on an annual basis. The budget for Federal fiscal year (FY) 1985 activities by Federal agencies are:

(1) USGS - $ 2,423,000
(2) FWS - $ 1,460,600
(3) USBR - $ 5,676,000
TOTAL $ 9,559,600

In FY 1986, the proposed budget will provide:

(1) USGS - $ 3,062,000
(2) FWS - $ 4,018,000
(3) USBR - $ 5,376,000
Total $12,456,000

The budget for activities in the ensuing period to FY 1990 has not been fully developed. The total budget for the 5-year period covering FY 1985 to 1990 is expected to be about $48 million. Detailed budgets are being developed and will be delineated in the Plan of Work. The Plan of Work will be appended to this Plan of Study and will direct overall work performance.

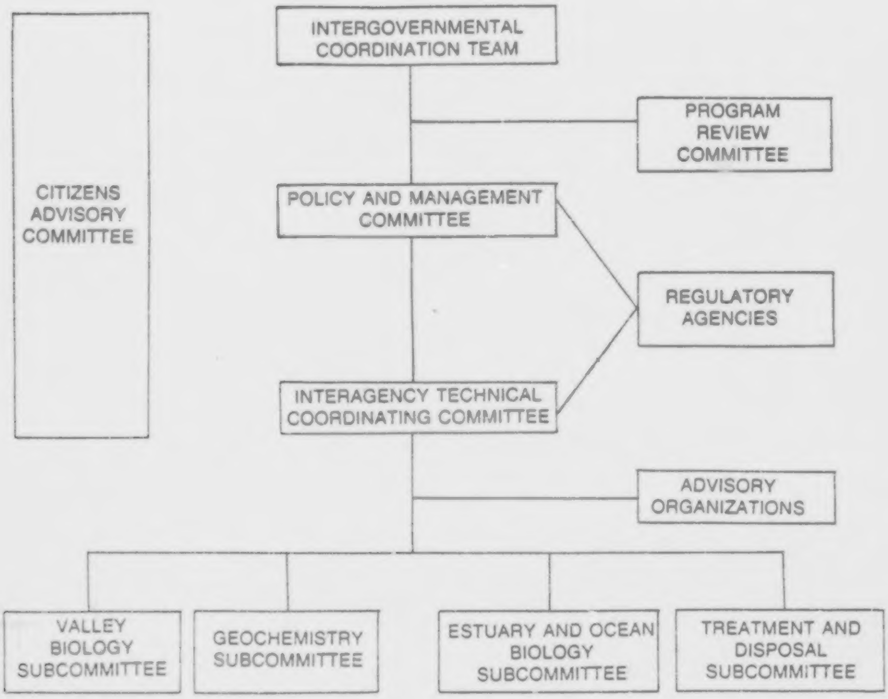
Summary descriptions of work currently underway are presented in Appendix B.

The California Department of Water Resources and Department of Fish and Game currently provide three full-time staff members with associated funding to the Study Team.

APPENDIX A

SAN JOAQUIN VALLEY DRAINAGE PROGRAM

INTERGOVERNMENTAL ORGANIZATIONAL STRUCTURE


INTERGOVERNMENTAL COORDINATION TEAM
CITIZENS ADVISORY COMMITTEE
PROGRAM REVIEW COMMITTEE
POLICY AND MANAGEMENT COMMITTEE
REGULATORY AGENCIES
INTERAGENCY TECHNICAL COORDINATING COMMITTEE
ADVISORY ORGANIZATIONS
VALLEY BIOLOGY SUBCOMMITTEE
GEOCHEMISTRY SUBCOMMITTEE
ESTUARY AND OCEAN BIOLOGY SUBCOMMITTEE
TREATMENT AND DISPOSAL SUBCOMMITTEE

Committee Membership

Intergovernmental Coordination Team

*USDI - Assistant Secretary for Water and Science
USDI - Assistant Secretary for Fish and Wildlife and Parks
US Bureau of Reclamation - Commissioner
US Fish and Wildlife Service - Director
US Geological Service - Director
CA Resources Agency - Secretary
CA Department of Water Resources - Director
CA Department of Fish and Game - Director
CA Environmental Affairs - Secretary
CA Water Resources Control Board - Chairperson

Citizens Advisory Committee

Membership to be determined

Program Review Committee

National Academy of Sciences, Water Science, and Technology Board - Committee on Irrigation Induced Water-Quality Problems

Policy and Management Committee

*USBR - Regional Director
USFWS - Regional Director
USGS - Regional Hydrologist
CA Department of Water Resources - Director
CA Department of Fish and Game - Director

Regulatory Agencies

US Environmental Protection Agency
CA Water Resources Control Board
CA Regional Water Quality Board, Central Valley Region

Interagency Technical Coordinating Committee

*US Bureau of Reclamation
US Fish and Wildlife Service
US Geological Survey
US Agricultural Research Service
CA Department of Water Resources
CA Department of Fish and Game
CA Department of Health Services

Advisory Organizations

University of California
California State University

Valley Biology Subcommittee

*US Fish and Wildlife Service
US Bureau of Reclamation
US Geological Survey
US Agricultural Research Service
US Environmental Protection Agency
CA Department of Water Resources
CA Department of Fish and Game

Geochemistry Subcommittee

*US Geological Survey
US Bureau of Reclamation
US Fish and Wildlife Service
US Agricultural Research Service
US Environmental Protection Agency
CA Department of Water Resources
CA Department of Fish and Game

Estuary and Ocean Biology Subcommittee

*CA Department of Water Resources
US Fish and Wildlife Service
US Bureau of Reclamation
US Geological Survey
US Environmental Protection Agency
CA Department of Fish and Game

Treatment and Disposal Subcommittee

*US Bureau of Reclamation
US Fish and Wildlife Service
US Geological Survey
US Environmental Protection Agency
US Agricultural Research Service
CA Department of Water Resources
CA Department of Fish and Game
CA Department of Health Services

*Asterisks denote Committee/Subcommittee chairpersons.

ROLES AND RESPONSIBILITIES

Intergovernmental Coordination Team

The Intergovernmental Coordination Team is composed of high level government officials (departmental assistant secretaries and agency directors at the Federal level and agency secretaries and directors at the State level) who are responsible for: providing broad program guidance; making key policy decisions; adjudicating differences of opinion among Federal agencies and/or State departments; and, selecting the preferred alternative for implementation. This group meets infrequently.

Citizens Advisory Committee

The Citizens' Advisory Committee will be composed of representatives of groups interested in and affected by the agricultural drainage issue. It will provide input on study goals, alternatives to be studied, issues to be addressed; develop areas of agreement and clarify disagreements among interest groups; and suggest economically feasible and politically acceptable means for accommodating the problems of salt management and drainage in the Western San Joaquin Valley. It will also perform an outreach function to broaden the base of public involvement of the study.

The committee is advisory and consequently will not be expected to direct or promulgate policy, interpret research findings, or provide administrative oversight for contracts pertaining to the study.

Program Review Committee

The National Academy of Sciences (National Research Council - Water Science and Technology Board) has entered into a cooperative agreement with the US Bureau of Reclamation to provide assistance in structuring and evaluating a comprehensive research program on irrigation-induced water quality problems in general and the San Joaquin Valley problems in particular. The Water Science and Technology Board has established the Committee on Irrigation Induced Water-Quality Problems and a number of specialty panels to carry out its responsibilities. Through periodic meetings, briefings, discussions, and the preparation of reports, the committee: reviews and provides advice with respect to overall program design; reviews activities in progress; and, helps in identifying and evaluating (including environmental and social impacts) a full range of alternative solutions.

Policy and Management Committee

The Policy and Management Committee is made up of Federal agency regional directors and directors of State departments. This committee meets on an as-needed basis and is responsible for: providing specific guidance regarding program direction and priorities; allocating funds and personnel as needed to accomplish work; and, reviewing and making decisions in response to recommendations of the Interagency Technical Coordinating Committee.

Regulatory Agencies

A number of agencies with regulatory responsibilities in air and water quality, toxics, human health, and related issues have been identified and will be asked to: review proposals; help assess impacts; and, provide advice in early planning stages. Some of those same agencies will serve in a permitting capacity in later design and implementation stages.

Interagency Technical Coordinating Committee

The Interagency Technical Coordinating Committee (ITCC) is composed of staff representatives of several Federal and State agencies. It meets on a regular basis and is responsible for: developing the overall program of study; directing the planning process (including impact assessment and evaluation of alternatives); reviewing proposed studies (including priorities, methodology, budget, and schedule); providing agency liaison and ensuring coordination of information (including data collection, analysis, storage, retrieval, and distribution) among concerned agencies and other affected parties; providing direction to and reviewing recommendations of the technical subcommittees; and, making recommendations to the Policy and Management Committee on a variety of appropriate topics including studies, program priorities, research design, laboratory procedures, quality control, public involvement, economic, social, and environmental impact assessment, evaluation of alternatives, and others, as necessary. Although not voting members, regulatory agencies (e.g., U.S. Environmental Protection Agency, CA Water Resources Control Board, and CA Regional Water Quality Control Board-Central Valley Region) participate in activities of the ITCC.

The ITCC is assisted in its role by the Study Team, some members of which also serve on the ITCC. The Study Team is an interagency group that works full-time on the San Joaquin Valley Drainage Program. In addition to serving in a support capacity to the ITCC, it also handles routine business and prepares a variety of documents (e.g., correspondence, memoranda of understanding, plans, budgets, reports, issue papers, etc.). The Study Team will be the principal organization responsible for plan formulation.

Advisory Organizations

The University of California and California State University systems will be invited to draw upon their expertise to develop information about specific issues and advise the involved Federal and State agencies throughout the planning process.

Technical Subcommittees

Four technical subcommittees also provide support to the ITCC. Their specific responsibilities include: identifying program information needs; developing technical information; reviewing study proposals and proposed courses of action; and, providing recommendations on technical issues to the ITCC. Each of the subcommittees is composed of several representatives of concerned Federal and State agencies. The four technical subcommittees are: Valley Biology Subcommittee; Geochemistry Subcommittee; Estuary and Ocean Subcommittee; and, Treatment and Disposal Subcommittee.

APPENDIX B

SUMMARY DESCRIPTIONS OF WORK CURRENTLY UNDERWAY AND PROPOSED

The U.S. Fish and Wildlife Studies

The U.S. Fish and Wildlife Service Studies (FWS) have been designed to produce, among other things, the information necessary for FWS to carry out its responsibilities pursuant to the Fish and Wildlife Coordination Act. In general, the studies address three broad issues:

- The geographic extent and severity of agricultural drainage-created contamination of fish and wildlife habitats and populations,
- Food-chain bioaccumulation, and
- Fish and wildlife toxicity.

Initial FWS study proposals have focused on resources of the San Joaquin Valley and Sacramento-San Joaquin Delta.

The development of additional study proposals is currently under consideration. They include:

- Determination of the effects of drainage contaminants upon bird disease resistance,
- Assessment of the feasibility of restoring drainage-damaged fish and wildlife habitats,
- Assessment of the impacts upon fish and wildlife resources that could be expected from disposal of agricultural drainage in areas outside the valley, including the Mojave Desert and Pacific Ocean, and

- Survey of endangered, threatened, proposed, and candidate species and their habitats in all areas potentially impacted by the project.

The U.S. Geological Survey

The U.S. Geological Survey (USGS) study plans embody a program of interrelated and coordinated studies to determine the source, distribution, transport, and fate of selenium and other constituents (particularly other trace elements) in the water and soils of the western San Joaquin Valley.

The USGS studies fall in four main areas developed from a conceptual model of selenium movement from geologic source materials to tile drainage waters and receiving waters:

- Geologic sources of selenium.
- Occurrence and mobility of selenium and other trace elements in soils and ground water.
- Ground-water flow systems and solute transport of selenium and other elements.
- Surface waters that receive agricultural drainage water.

The U.S. Bureau of Reclamation

The U.S. Bureau of Reclamation (USBR) studies are designed to contribute basic information in seven ~~six~~ categories:

- Sociological studies.
- Economic studies.
- Drainage treatment and disposal technology.
- Onfarm drainage/irrigation management.

- Environmental studies and impact assessment.
- Financial studies.
- Design and construction of facilities

Additionally, USBR will continue to execute its responsibilities at Kesterson Reservoir pursuant to the California State Water Resources Control Board Order WQ-85-1.

The Office of the San Joaquin Valley Drainage Program (and the Interagency Study Team)

The Office of the San Joaquin Valley Drainage Program (SJVDP) has overall responsibility for program administration, plan formulation, and evaluation. All basic data and analytical study needs, which are not currently proposed or underway by FWS, USGS, and USBR, will be identified by the SJVDP who has responsibility for their development. Additionally, the SJVDP will conduct the Public Involvement Program.

DRAFT - July 19, 1985

DRAFT

Attachment 2

SAN JOAQUIN VALLEY DRAINAGE PROGRAM

PLAN OF WORK
(FOR DEVELOPING A PLAN OF ACTION)

Office of the San Joaquin Valley Drainage Program

U.S. Department of
the Interior
-Bureau of Reclamation
-Fish and Wildlife
Service
-Geological Survey

The Health and Welfare
Agency of California
-Department of Health
Services

The Resources Agency
of California
-Department of Water
Resources
-Department of
Fish and Game

July 1985

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Data Collection Baseline Inventory 3
Identification and Estimation of Key Parameters 4
Plan Formulation 4
Forecasting 5
Milestones 5
Budget 6

APPENDIX A - Outline for the Plan of Work A-1
(For Developing a Recommended Plan of Action)

APPENDIX B - Study Summaries and Budgets B-1

APPENDIX C - San Joaquin Valley Drainage Program C-1
Overall Budget Summary

INTRODUCTION

This Plan of Work (POW) describes the planning process and research activities that will be used in the San Joaquin Valley Drainage Program. The planning process will result in the formulation, evaluation, and selection of alternative resource management plans that best meet the objectives as stated in the Plan of Study (Office of the San Joaquin Valley Drainage Program, July 1985). The actual planning process involved in the formulation and evaluation of these plans consists of four essential tasks that will contribute to the development of analytical techniques:

- develop measurable objectives,
- collect data (baseline inventory) and from that data,
- identify causal relationships between key parameters, from these relationships,
- develop an analytical framework that will allow forecasting of spatial and temporal impacts of alternative plans

These tasks in combination can provide an analytical basis for evaluating various plan proposals. In combination, they can be used to forecast the impacts of each proposed plan.

The planning and research activities outline (see Appendix A) will be developed into a detailed work plan leading to selection of (a) recommended plan(s) of action and appended to the Plan of Study. The detailed work plan will include a detailed discussion of data sources, analytical methodology, and a critical path analysis that portrays the output and timing of all study components in an integrated fashion. The outline, like the Plan of Study, includes the proposed studies of the Fish and Wildlife Service, Geological Survey, and Bureau of Reclamation. Additional work by the State of California will be included where appropriate. Other areas of research which are not covered by the above named Federal agencies or the State of California will be identified and ordered (by task order or intergovernmental agreement) by the Study Team of the Interagency Technical Coordinating Committee (ITCC).

Before discussing each of these tasks in more detail and presenting an outline of the POW, a brief summary of the planning process follows. Using the data collected during the baseline inventory phase, along with physical, chemical, biological, and social sciences laws and hypotheses, causal relationships will be developed between key parameters. The key parameters are identified primarily from empirical research performed under the auspices of the San Joaquin Valley Drainage Program and secondarily from scholarly research in each discipline. To the extent possible, using recognized and accepted scientific methods, the causal relationships between key parameters will be empirically estimated. The resulting "system" can actually appear in a number of forms from sophisticated computer/mathematical models to relational data bases.

Forecasting the impacts of various alternative plans is accomplished by examining (analyzing) changes in the values of key parameters. These values are compared to the targeted objectives embodied in the Plan of Study, and the alternative(s) most closely meeting the objectives will be selected for further analysis and possible recommendation for action.

Measurable Objectives

The objectives of the San Joaquin Valley Drainage Program fall under the following headings and appear in the Plan of Study (pp. 7-9):

- public health
- fish, wildlife, and their habitat
- agricultural productivity and lands
- water quality and quantity
- financial concerns
- economic concerns
- public acceptance
- social impacts

The objectives that are outlined under the above headings range from regulatory and statutory to economically optimal and socially equitable, among many. They were identified and are being more specifically developed through a Federal-State interagency and interdisciplinary process and reflect the areas of responsibility covered by each agency as well as information obtained at public workshops on the issue (Public Workshops on Planning to Solve Salt Management and Contaminant Problems in the Western San Joaquin Valley - Response Summary, June 1985).

Data Collection Baseline Inventory

The baseline inventory represents knowledge of the physical/chemical, biological/ecological, social/economic, institutional/legal, and political systems affecting or affected by agricultural drainage and related activities. As this body of information is collected, problems and opportunities will become more focused. Data collection and refinement are expected to continue throughout the plan evaluation process in order to benefit the study with increased knowledge as it progresses.

Data collection focuses on the following general areas:

- physical and chemical systems
- biological systems
- social and economic systems
- legal and institutional systems

Identification and Estimation of Key Parameters

While a clearer picture of the current salt management and contaminant problems is obtained during the baseline inventory step, an understanding of how the various systems (physical/chemical, biological/ecological, social/economic, institutional/legal, and political) function together will be developed concurrently to the extent scientifically practicable. Causality between key parameters is established using recognized and accepted scientific knowledge and direct research resulting from the study. The degree of cause and effect between key parameters is established as rigorously as possible given the level of information, time, budget, and expected sensitivity of study outcomes. Generally, study outcomes are functions of the individual behavioral assumptions and hypotheses involved. Some assumptions and hypotheses can have major impacts on study outcomes. As a system analysis develops, sensitivity analyses can illustrate those impacts and identify parameters that may require further investigation.

Plan Formulation

Concurrent with data collection and identification of key parameters is the plan formulation process. This process results in sets of resource management options which most closely satisfy the study objectives as evaluated in the integrated parametric system. The formulation process begins with a detailing of the potential solutions to the salt management and contaminant problems in the study area. Solutions be as technical, legal/institutional, hydrologic/operational, or agricultural/behavioral, among others.

Basic technical information must be obtained in order to ascertain potential for satisfying study objectives of each component of an overall plan. More detailed evaluations of components will rely upon development of the integrated parametric system. It is anticipated that these components will satisfy the study objectives as a "solution" only when put together into a comprehensive resource management plan. With this expectation in mind, these components will be evaluated both spatially and temporally in sensitivity analyses to observe their individual contributions toward satisfying objectives in a least costly fashion.

Forecasting

Forecasting is also an ongoing process which begins when the rudimentary integrated parametric system is developed and various sensitivity analyses begin. The intermediate product of forecasting is plan formulation. However, the final output of forecasting is an exhaustive evaluation of the effects, across geographic locales and over time, of the recommended plan(s).

Milestones

The planning process is currently expected to be conducted through the period covering FY 1985 to FY 1990 (5 years). The basic studies and reports will be prepared in the latter 4 years with the last year (FY 1990) scheduled for agency and public review of reports, including the completion of the first stage of an environmental impact statement. The major milestones are tentatively scheduled as follows:

	Date
1. Complete Plan of Study	August 1985
2. Complete Plan of Work	August 1985
3. Initiate major studies:	
a. USGS	January 1985
b. FWS	June 1985
c. USBR	July 1985
d. Study Team - integrated systems analysis	September 1985
4. Program reviews for FY 1986	January/July 1986
5. Program reviews for FY 1987	January/July 1987
6. Program reviews for FY 1988	January/July 1988
7. Complete major studies:	
a. USGS	September 1989
b. FWS	September 1989
c. USBR	September 1989
d. Study Team - integrated systems analysis	September 1989
8. Complete draft reports	September 1989
9. Complete draft EIS	September 1989
10. Clearance of draft reports	June 1990
11. Complete EIS	September 1990
12. Complete program reports	September 1990

Budget

The budget for conducting the integrated parametric systems analyses beyond those basic research components identified in the Fish and Wildlife, Geologic Survey, Bureau of Reclamation, and State of California study proposals is as follows (for a summary of each agency's specific study proposals and budget, see Appendix B). For the overall summary of the San Joaquin Valley Drainage Program budget, see Appendix C.

	FY 1985	1986	1987	1988	1989	1990	Total
Cost (X$1000)	--	2,000	2,000	2,000	2,000	1,000	9,000

APPENDIX A

OUTLINE FOR THE PLAN OF WORK
(FOR DEVELOPING A RECOMMENDED PLAN OF ACTION)

Outline for the Plan of Work
(For Developing a Recommended Plan of Action)

I. Develop Measurable Objectives

II. Collect Data (current and historic)

  A. Physical/Chemical Systems

    1. Geological

    2. Hydrological

      a. Surface water (quality, quantity)
      b. Ground water (quality, quantity)

    3. Meteorological

  B. Biological Systems

    1. Fish

    2. Wildlife

    3. Reptiles, amphibians, invertibrates

    4. Plants

    5. Habitats

  C. Human Systems

    1. Sociological (populations, communities)

      a. Employment type
      b. Income
      c. Housing
      d. Education
      e. Land tenure
      f. Quality of life

    2. Epidemiological

      a. Food
      b. Water
      c. Air

D. Economic Systems
  1. Agricultural
  2. Municipal
  3. Industrial
  4. Residential
  5. Public trust, environmental
  6. Regional and local fiscal

E. Legal/Institutional Systems
  1. Laws, regulations, statutes
  2. Contracts

III. Identify Causal Relationships (Systems Analysis)

A. Physical/Chemical System
  1. Primary source areas - geochemistry, hydrology
  2. Secondary source areas - irrigated lands - geochemistry, hydrology
  3. Introduced sources
    a. Irrigation water (salts, heavy metals, and trace elements)
    b. Applied chemicals (fertilizers, herbicides, pesticides)
  4. Application - leaching - concentration relationship
  5. Drainage/drainage collection (see Part IV.A. Agricultural Activities) - quality/quantity
  6. Mobility of heavy metals and trace elements
  7. Ground water flow systems and solute transport of trace elements
  8. Surface waters that receive agricultural drainage - quality and quantity
  9. Hydrologic operations analyses
  10. Meteorological activity

B. Biological Resources

- 1. Effects of agricultural drainage-related activities upon biological resources
    - a. Background (extent and severity of contamination - fish, wildlife, and their habitats)
        - (1) Kesterson Reservoir and San Luis Drain
        - (2) Grasslands
        - (3) San Joaquin Basin/Tulare Lake Basin/San Joaquin River/Bay-Delta
        - (4) State Water Project service area
    - b. Toxic agents and effects (acute and chronic effects upon mortality, reproduction, migration, etc.)
        - (1) Synergism - antagonism
        - (2) Bioaccumulation
    - c. Toxic levels and safe levels
        - (1) Aquatic systems
            - (a) Freshwater
            - (b) Estuarine-brackish water
            - (c) Ocean
        - (2) Terrestrial systems (technical feasibility, alternative techniques, costs, etc.)
        - (3) Habitat restoration

C. Social Systems

- 1. Social assessment
    - a. Social impacts of alternatives
    - b. Opportunities/options to mitigate adverse social effects
- 2. Health assessment
    - a. Epidemiological/health impacts
    - b. Preventative measures

D. Economic Evaluation and Impacts

- 1. Direct economic benefits and costs
    - a. Agricultural
    - b. Municipal

        c. Industrial
        d. Residential

    2. Public trust/environmental values

    3. Regional and local fiscal impacts

    4. Construction, operation, maintenance, and replacement costs

E. Agricultural Activities - Impacts on drainage quantity, quality, and desertification process

    1. Cropping changes

    2. Irrigation technologies and practices, soil and pest management

    3. Drainage reuse

    4. Land retirement

    5. Dry farming

F. Legal/Institutional Systems, Opportunities and Constraints

    1. Water transfers and trades

    2. Drainage effluent pricing

    3. Water pricing

    4. Project reauthorization

    5. Legal/regulatory situation

        a. Implications for equity and efficiency
        b. Cost savings and foregone opportunities resulting therefrom

IV. Selection and Evaluation of Alternative Resource Management Plans

A. Agricultural Practices

    1. Cropping changes

    2. Changes in irrigation technologies and practices, soil and pest management

    3. Drainage reuse

    4. Land retirement
    5. Dry farming

B. Legal/Institutional Systems, Opportunities, and Constraints

    1. Water transfers and trades
    2. Drainage effluent pricing
    3. Water pricing
    4. Project reauthorization
    5. Legal/regulatory situation
        a. Implications for equity and efficiency
        b. Cost savings and foregone opportunities resulting therefrom

C. Treatment/Disposal, Engineering

    1. Technical feasibility and cost
        a. Physical/chemical
            (1) Precipitation and settling
            (2) Ion exchange
        b. Desalinization
            (1) Reverse osmosis
            (2) Thermal distillation
            (3) Evaporation
        c. Biological
            (1) Algal ponds
            (2) Aerobic, anaerobic processes
            (3) Silvaculture
            (4) Aquaculture
            (5) Bacterial, enzyme processes
        d. Land disposal
            (1) Evaporative ponds
            (2) Deep-well injection
        e. River discharge

- f. Estuarine discharge
- g. Ocean discharge
- h. Reuse
  - (1) Powerplant cooling
  - (2) Salt reclamation
  - (3) Irrigation
  - (4) Wetlands
- i. Others

2. Water quality and quantity implications of IV.A.1a thru 1i

3. Engineering factors for design (various stages)
   - a. Transport
   - b. Collection

D. Financial Implications

1. Cost-sharing/repayment alternatives and impacts

2. Financial incentives
   - a. Grants
   - b. Low interest loans
   - c. Tax incentives
   - d. Equity
   - e. Efficiency

V. PREPARATION OF REPORTS

A. Planning Report

B. NEPA Compliance

APPENDIX B

STUDY SUMMARIES AND BUDGETS

INTERAGENCY TECHNICAL COORDINATING COMMITTEE - STUDY TEAM

1. Alternative Analyses/Plan Development

Background Needs

The development of a comprehensive San Joaquin Valley Drainage Plan will depend on a series of coordinated and interrelated activities. These will require technical support in terms of special studies, field and laboratory support, plan development with alternative analyses and the preparation of an Environmental Impact Statement. An important need is to integrate the series of interrelated studies in order to develop and evaluate a comprehensive plan for implementation.

Objectives

The major objective of the activity is to develop a comprehensive plan for a solution to the San Joaquin Valley Drainage problem that can meet social, economic and environmental objectives for the study area as stated in the plan of study (Office of the San Joaquin Valley Drainage Program, July 1985).

Approach

The development of a comprehensive San Joaquin Valley Drainage Program Plan will require a multidisciplinary and multiagency approach that must be closely coordinated. The approach will depend on technical studies to provide input to plan development, the analysis of alternatives, public involvement, the preparation of an Environmental Impact Statement and the documentation of the plan.

The technical studies will be integrated using an integrated parametric systems analysis approach. Various alternatives alone or in combination will be evaluated using this integrated systems approach. Though the integrated system uses the output of specific studies, its development requires further analytical work. This analytical work can range from mathematical/computer models to relational data bases. After the integrated system has been developed and all alternatives have been evaluated, a comprehensive report will be prepared so that decisionmakers will be provided the necessary technical information to select the most acceptable plan for implementation.

Budget: X1000

1985	1986	1987	1988	1989	1990	Total
-	2,000	2,000	2,000	2,000	1,000	9,000

Output

An integrated systems analysis and comprehensive San Joaquin Valley Drainage Plan will be prepared with alternatives and related costs for plan implementation. The recommendation of a preferred plan will be made in the planning document but an implementation plan will depend on public involvement and the political process in the selection. Ultimately the process of legislative actions would be coupled with the commitment of funds for plan implementation. A major output will be an Environmental Impact Statement for alternative plans, which can assist decisionmakers in the process of selecting a plan of action.

2. National Academy of Sciences

Background Needs

The development of a comprehensive San Joaquin Valley Drainage Plan will depend on a series of coordinated and interrelated activities. It will involve a multidisciplinary approach that extends beyond the traditional program and project development. Because of the unique problems involved, there is need for an overview of the program and related activities by a high level and eminent group.

Objectives

An overview of this program will be provided by external experts made available through the Water Science and Technology Board of the National Academy of Sciences, and the National Engineering Academy.

Approach

The development of a comprehensive San Joaquin Valley Drainage Program Plan will require a multidisciplinary and multiprong approach that have to be closely coordinated. To provide an overview of the program and activities, the National Academy of Sciences will be contracted for this service.

Budget: X1000

1985	1986	1987	1988	1989	1990	Total
136	150	150	150	150	-	736

Output

The National Academy of Sciences will provide review of program and program activities to ensure that methods, approaches, and implementation of studies will meet the highest technical standards. The quality of reports will be enhanced through this review process.

BUREAU OF RECLAMATION

1. Drainage Treatment and Disposal

Background Needs

The development of a comprehensive San Joaquin Valley Drainage Plan will depend on a series of coordinated and interrelated activities. These will require technical support in terms of special studies. The problems of agricultural drainage treatment and disposal will require unique approaches and solutions, since there are no models for guidance. There is a need to study and develop treatment technology and disposal alternatives.

Objectives

The major objective of the activity is to study and develop various treatment technology and disposal alternatives for a solution(s) to the San Joaquin Valley Drainage problem. This will require the development of alternative technologies which are economically viable, technically feasible and environmentally sound. Disposal alternatives must meet receiving water standards and protect beneficial uses.

Approach

A major activity in the development of the plan is to seek cost-effective methods to treat agricultural drainage water. A key requirement is for the process to meet effluent limitation levels and, if discharged, to comply with disposal requirements of regulatory agencies. Selected treatment processes will undergo research review, laboratory testing, field/pilot plant evaluation. These will include biological and physical chemical processes.

Disposal alternatives will be reviewed and will include: (1) In-basin disposal, (2) estuary disposal, (3) ocean disposal, (4) in-land disposal, and (5) deep-well injection.

Budget: X1000

1985	1986	1987	1988	1989	1990	Total
350	2,500	2,500	2,000	250	-	8,050

Output

Treatment alternatives will be identified and most promising technology will be field tested for consideration in an alternative analysis. Evaluation of alternatives will include feasibility of selenium and other element removal, relative cost, and effectiveness of removal process. Disposal alternatives will be studied to support technical and environmental aspects of analyses. Reports will be prepared to provide data and information to assist decisionmakers as to the technical feasibility, economic viability, and environmental soundness of various treatment and disposal alternatives.

2. Onfarm Management

Background Needs

The development of a comprehensive San Joaquin Valley Drainage Plan will require technical support in terms of special studies. The problems of agricultural drainage will require unique approaches and solution, since there are no models for guidance. There is need to study alternative management of onfarm practices to reduce drainage flow, salt loads, and toxic substances.

Objectives

The major objective of the activity is to develop onfarm management practices for a comprehensive plan for a solution to the San Joaquin Valley Drainage problem. This will require the study of current practices and the development of alternative management plans.

Approach

The development of a comprehensive San Joaquin Valley Drainage Program Plan will require a multidisciplinary and multiprong approach that has to be closely coordinated.

The possibility for the control or the immobilization of pollutants on farm sites will be investigated since this approach can provide a solution related to the source of emission and therefore has many advantages in dealing with the problem. Approaches can involve cropping patterns, irrigation practices, and the control of pollutants by chemical and biological methods. These are approaches that will demand innovation since there is no practical experience for guidance. This will involve laboratory studies and field studies.

Budget: X1000

1985	1986	1987	1988	1989	1990	Total
100	1,000	1,000	1,000	1,000	-	4,100

Output

Feasibility of alternatives of onfarm management practices will be evaluated and reports prepared to validate current efficiency, identify new methods to improve efficiency, and identify selenium immobilization methods to reduce drainage flow and salt loads and emission of toxic substances from irrigated lands.

3. Social Assessment

Background Needs

There is need to consider the social effects as part of decisionmaking process and to report findings in Environmental Impact Statements (EIS). Social assessment must be integrated into economic and technical studies to develop potential plan alternatives for analyses. In the San Joaquin Valley Drainage Program, the social assessments are considered important.

Goals/Objectives

The objectives of social assessment will be to: (1) Compile baseline data to facilitate plan formulation and decisionmaking process; (2) identify potential and expected beneficial and adverse social impacts of plan alternatives and identify needs for social mitigation; and (3) prepare the documentation required for NEPA compliance.

Approach

Social assessment will be conducted during the early stages of the planning process to identify social concerns and needs of affected sectors of the population to help formulate plan alternatives. Information developed in the social investigation supplements the public involvement plan to insure that interested and impacted interests have the opportunity to participate in the planning process. The data collection process will consist of profiling and collecting baseline data on communities in the study area and identifying impacts upon populations and interest groups.

Budget: X1000

1985	1986	1987	1988	1989	1990	Total
50	300	300	300	80	-	1,030

Output

Social assessment reports will be prepared to identify social impacts of various drainage program decisions.

4. Economic Investigations and Analyses

Introduction

Economic analysis is an essential part of the plan formulation and evaluation process. It provides necessary information to formulate plans that achieve program objectives in the least costly fashion and indicates which plans make the greatest contributions to society's material and spiritual well-being. This information, in continuation with pertinent social and environmental information, is used in selecting a preferred plan.

Background and Objectives

Economic evaluation of alternative plans' accomplishments and costs are required by good planning practice and the Principles and Guidelines, which serves as a useful guide for water resource planning. Comparison of initial plan economic benefits and life cycle costs will indicate which plans are expected to generate the greatest economic net benefit to society and which plans ought to be carried forward for further evaluation. The economic analyses will go beyond those required by Principles and Guidelines and will include such nonmarket benefits as environmental quality and associated values.

Approach

The level of accomplishments for each plan must be estimated. Where acceptable techniques exist, accomplishments (known as benefits) will be monetized and expressed in terms of a common time basis and price level. In cases where methodologies to monetize benefits are now lacking, approaches will be explored in an attempt to develop an acceptable method. As appropriate, ranges of values and sensitivity analyses will be featured in cases of risk and uncertainty.

Life cycle costs of alternative plans will be expressed at a common point in time and price level (same as benefits). Benefits and costs will be compared.

Budget: X1000

1985	1986	1987	1988	1989	1990	Total
50	300	300	300	150	-	1100

Output

Least-cost and economically efficient alternatives will be identified.

5. Financial Investigations and Analyses

Introduction

Many diverse financial investigations and analyses will be necessary to prepare both a financial impact analysis and a publicly and institutionally acceptable financial/repayment plan for the preferred plan. Any plan submitted to Congress for authorization and appropriations will need to feature an allocation of costs among functions served, a repayment plan, and a plan for sharing in constructing funding by non-Federal entities.

Background and Objectives

Chief among the reasons that previously developed San Joaquin Valley drainage plans have not been implemented is the failure to formulate repayment arrangements acceptable to interests in the drainage problem area. No plan, however technically effective, environmentally sound, or economically efficient, will ever be implemented unless acceptable financing/repayment arrangements have been developed.

Approach

Financial studies, based on a cost allocation, will explore a variety of cost-sharing and repayment arrangements, as well as mechanisms for non-Federal construction financing. The plan may rely on drainage levies; water charges; land assessments; special district taxes, grants, and low interest rate loans; and other mechanisms as appropriate to generate repayment. The cost allocation, repayment, and financing arrangements must be equitable and acceptable. In addition, the impact of various financing/repayment plans on various economic sectors and the region vis-a-vis the rest of the Nation will be analyzed.

Budget: X1000

1985	1986	1987	1988	1989	1990	Total
-	100	100	100	75	-	375

Output

An acceptable and equitable financing/repayment plan and analysis of financial impacts.

6. Regional Economic Impacts

Introduction

Regional economic impact analysis will identify and estimate the effects of implementing alternative plans on regional economic activity, measured in terms of production, income, and employment. This information is useful in determining distribution of economic effects of a plan on the local economy and the local economy vis-a-vis the rest of the Nation.

Background and Objectives

Regional economic impact analysis is important to proper water resource planning and is encouraged by the Principles and Guidelines. It is especially important to quantify these impacts where inaction threatens the economic base and well-being, or even continued existence, of numerous communities. The information generated will be used in evaluating and selecting a preferred plan.

Approach

Regional input-output methodology will be used to estimate regional production, income, and employment impacts of alternative plans.

Plan of Activity

One or more regional input-output models for the impact area will need to be developed and then used to estimate impacts.

Budget: X1000

1985	1986	1987	1988	1989	1990	Total
10	125	125	50	15	-	325

Output

Impacts of alternative plans, including no action, on regional output, income, and employment, will be identified. Incidence of impacts among sectors and regions vis-a-vis rest of the Nation will also be identified.

7. Environmental Studies and Environmental Impact Statement

Background Needs

The development of a comprehensive San Joaquin Valley Drainage Plan will depend on a series of coordinated and interrelated activities including the preparation of an Environmental Impact Statement. The problems of associated agricultural drainage will require unique approaches and solution, since there are no models for guidance. It will involve a multidisciplinary approach that extends beyond the traditional program and project development. In this context, there is need to develop an EIS in compliance with the National Environmental Protection Act.

Objectives

The major objective of the activity is to study and develop an Environmental Impact Statement for the comprehensive plan for a solution to the San Joaquin Valley Drainage problem. This will require the evaluation of alternative plans, so that a final solution can be presented to interested bodies which can meet their perceived needs to develop the water resources and the agricultural activities and to meet the social, economic and environmental development of the area and concerned people.

Approach

An Environmental Impact Statement will be prepared for the various alternatives under study. An Environmental Impact Statement will be prepared to supplement the earlier document prepared in 1970 for the San Luis Unit of the Central Valley Project.

Budget: X1000

1985	1986	1987	1988	1989	1990	Total
50	700	1,000	1,000	250	-	3,000

Output

A comprehensive San Joaquin Valley Drainage Plan will be prepared with several alternatives and related costs for plan implementation. The designation of a preferred alternative will not be made in the planning document but will depend on public involvement in the selection process and the process of legislative actions which would be coupled with the commitment of funds. A major output will be an Environmental Impact Statement for the alternative plans, which can assist decisionmakers in the selection process.

8. Public Involvement

Background Needs

The development of a comprehensive San Joaquin Valley Drainage Plan will depend on a series of coordinated and interrelated activities. These will require public involvement in plan development. A multidisciplinary approach will be needed that extends beyond the traditional program and project development and will include the need for public involvement activities.

Objectives

The major objective of the activity is to develop public involvement activities in support of a comprehensive plan for a solution to the San Joaquin Valley Drainage problem. The public should review and provide input to the plan development process. A final solution can be agreed in a public forum by all interested bodies so that perceived needs to develop the water resources and the agricultural activities to meet social, economic and environmental needs can be met.

Approach

The development of a comprehensive San Joaquin Valley Drainage Program Plan will require a multidisciplinary and multiprong approach that has to be closely coordinated. Public involvement is considered an essential activity to gain public confidence in the outcomes of the studies so that implementation can proceed with public support. A program of public information and workshops will be carried out to keep the public informed and to involve their participation in the plan development process.

Budget: X1000

1985	1986	1987	1988	1989	1990	Total
50	350	350	200	100	-	1,050

Output

A program of public involvement will be developed to provide more information to interested organizations and individuals, to develop greater community involvement, and to promote better acceptance of process and alternatives of plans.

U.S. Fish and Wildlife Service*

	$ x 1,000
Aquatic Monitoring	819.4
Toxicity of Contaminants	1,528.8
Bioaccumulation of Contaminants	997.7
Uptake and Loss Rates	865.3
Waterfowl Tolerance of Chronic Exposure	524.0
Uptake and Effects of Contaminants	1,105.8
Interactive Effects of Contaminants	495.9
Development of Capability to Predict Contaminants	802.6
Geographic Information System	2,440.6
Grassland Study	983.7
Hazing Program	1,035.6
Contaminant Analyses of Food Chain	39.9
Shorebird Reproduction	7.7
Bird Condition and Health	5.5
	11,652.5

*See USFWS Proposals to USBR dated April 22, 1985, abstract not available.

U.S. GEOLOGICAL SURVEY STUDY PROPOSALS

INTRODUCTION

Agricultural production in irrigated low-elevation areas of the western San Joaquin Valley is affected by waterlogging of soils and salt accumulation in the crop root zone. Since 1960, subsurface tile drains have been installed to remove water and salts from about 85,000 acres of affected farmland. Drainage water from about 8,000 acres is discharged into the San Luis Drain, which terminates at Kesterson Reservoir. Drainage water from about 77,000 acres is discharged to drains and canals that flow into wetlands (mainly in the Grassland Water District area). Water from these wetlands eventually discharges by surface flow or seepage to the San Joaquin River, which flows into the San Francisco Bay-Delta.

During the 1982-84 period the U.S. Fish and Wildlife Service (USFWS) identified a number of fish and waterfowl mortality and reproduction problems in the Kesterson Reservoir area which were attributed to selenium toxicity based on high concentrations of tissue selenium and toxicity symptoms.

The U.S. Geological Survey's (USGS) involvement in the problem began in early summer 1983, when the USFWS asked the USGS to test drainage water in the San Luis Drain for selenium and other constitutents. Since then, the U.S. Bureau of Reclamation (USBR) has asked the USGS to participate in an interagency study of the salt and drainage water-quality problem in the western San Joaquin Valley.

The USGS study plan outlined in this document summarizes a program of interrelated and coordinated studies to determine the source, distribution, transport, and fate of selenium and other constituents (particularly other trace elements) in the water and soils of the western San Joaquin Valley.

The USGS studies fall in four main topic areas developed from a conceptual model of selenium movement from geologic source materials to tile drainage waters and receiving waters:

(1) Geologic sources of selenium:
(2) Occurrence and mobility of selenium and other trace elements in soils and ground water;
(3) Ground-water flow systems and solute transport of selenium and other elements; and
(4) Surface waters that receive agricultural drainage water.

The USGS will provide reports on each of the studies and logical points during the course of each project. Final reports will be issued at the conclusion of each study.

Geologic Sources of Selenium

The ultimate source of selenium and other elements in the soils of the western San Joaquin Valley is believed to be the minerals contained in marine rocks that underlie the Central Valley and that outcrop in the Coast Ranges to the west. Selenium is believed to be incorporated as a substitute for sulfur in the mineral pyrite contained in marine shales, siltstones, and sandstones. As the pyrite is exposed and oxidized during the weathering process in the Coast Ranges, it decomposes and the selenium is oxidized to selenate. One hypothesis is that rainfall seeping into the weathered pyrite dissolves magnesium sulfate and sodium sulfate minerals that contain selenate selenium. These minerals either dehydrate during dry periods to form selenium-containing salts, or are transported to streams via overland flow. Salts at land surface can be dissolved and transported to streams by subsequent rainfall. Erosion of exposed minerals and transport as sediment in overland flow to streams can also occur. The USGS study plan includes a study to test this hypothesis about the origin of minerals from the Coast Ranges and the geochemical processes affecting the mobility and transport of selenium from the Coast Ranges to the Valley. This study is:

"Geochemical research, sources and distribution of selenium, west side of San Joaquin Valley," by Ivan Barnes.

Occurrence and Mobility of Selenium and Other Trace Elements in Soils and Ground Water

High concentrations of selenium and other elements in the subsurface agricultural drianage water are believed to originate from some combination of:

(1) dissolution and downward transport by irrigation water of salts concentrated in near-surface soils;

(2) dissolution of salts and minerals that are in the alluvial parent material of the soils as the water table has risen in response to irrigation; and

(3) a long-term build-up of high concentrations in the shallow ground water by a combination of the two prcesses described above and concentration by evapotranspiration.

Determination of the relative importance of these, or possibly other processes, is crucial to understanding how agricultural management practices, such as selective use of certain land or alternative irrigation techniques, may be used to help reduce drainage quality problems.

Studies that, in combination, are designed to address these issues are:

(1) "Spatial and temporal distribution of selenium and other trace elements in the soils and shallow ground water of the western SanJoaquin Valley", by S.J. Deverel, Ron Tidball (Geologic Division), and Roger Fujii;

(2) "Selenium speciation and redox parameters", by D.K. Nordstrom.

A primary concern for the western San Joaquin Valley is whether or not the regional aquifer system in the area has been contaminated by downward leakage from the near-surface ground water that is high in selenium. This could occur by slow leakage through the fine-grained materials underlying the shallow ground water, leakage through permeable "windows" in the fine-grined material, or by leakage down the gravel-packed annular spaces of the thousands of old wells in the area. An additional possiblity is that the deep ground-water in the area, as well as the shallowest water-table aquifer, has high background concentrations of selenium or other elements in some areas. The study designed to address these issues is:

"Areal and depth distribution of selenium and other trace elements in the regional ground-water system of the western San Joaquin Valley" by J.M. Neil.

Ground-Water Flow Systems and Solute Transport of Selenium and Other Trace Elements

At both the regional scale and the agricultural-field scale, knowledge of the movement of selenium and other elements in ground water is needed in order to evaluate the history of water measured at particular sites and depths, the nature of the relationships among local and regional soil conditions, the quality of underlying ground water, and the potential for movement of water of different quality between and within (laterally and vertically) aquifers.

Achieving an understanding of these and related factors requires a very detailed characterization of the geology of the area, particularly in the shallower deposits, and quantitative assessment via simulation modeling of flow systems at both local and regional scales. The study that addresses these needs is:

> "Hydrogeology of the Western San Joaquin Valley" by K.R. Belitz and R.W. Page.

This hydrogeology study by Belitz and Page will be closely coordinated with related studies of the distribution and mobility of selenium and other elements with the goal of developing a solute transport model.

Surface Waters that Receive Agricultural Drainage

Surface waters that receive drainage from irrigated land in the western San Joaquin Valley are the San Luis Drains and other drains, irrigation supply canals, Kesterson Reservoir, wetlands in the Grasslands Water District area, and the San Joaquin River. As a result, the San Francisco Bay-Delta is receiving drainage water indirectly via the San Joaquin River. The USGS studies focus on Kesterson Reservoir, the San Joaquin River, and the San Francisco Bay-Delta.

Kesterson Reservoir is a valuable "laboratory" for studying the behavior of selenium and other trace elements in an evaporative pond system that has received drainage water for several years. Unresolved, key issues to management include the possible formation of toxic gases, selenium speciation in pond water, and the degree of selenium sorption in anaerobic bed sediments. Studies which address these are:

(1) "Microbiological Aspects of the Biogeochemistry of Selenium" by R.S. Oremland.

(2) "Selenium speciation and redox parameters" by D.K. Nordstrom.

The San Joaquin River runs north down the trough of the San Joaquin Valley and is the only surface outlet from the valley for drainage water. Drainage from at least 77,000 acres of tile-drained land eventually reaches the river. Other drainage may also reach the river by ground-water inflow. The river is the means by which drainage water now reaches the San Francisco Bay-Delta. Managers need to know the effects of agricultural drainage water on concentrations of selenium and other constituents in the river, on their transport in the river system, on aquatic communities of the river, and on loading to the San Francisco Bay-Delta. The study which addresses this need is:

> "Occurrence and Transport of Selenium and Other Trace Elements in the San Joaquin River" by D.G. Clifton and R.J. Gilliom.

Important factors regarding the effect of agricultural drainage water on the San Francisco Bay-Delta are the rate of assimilation of selenium into the aquatic food chain and the potential accumulation and biological assimilation of selenium and other trace elements in bed semiments. Studies which relate to these issues are:

(1) "Rate Processes of Phytoplankton from the Northern San Francisco Bay Estuary" by J.E. Cloern and Sally Wienke; and

(2) "Toxic Metals in Sediments and Benthos" by Sam Luoma.

Relationship of USGS Studies to Other Studies

Together, the studies that make up the USGS study plan comprise an integrated approach to investigating the source, distribution, transport, and fate of selenium and other trace elements in the hydrologic system of the western San Joaquin Valley. However, these studies are not the only studies of this type needed or planned for the area. For example, the United States Fish and Wildlife Service (USFWS) will be conducting extensive biological studies, many private consultants are becoming involved, and the University of California is planning extensive research with some similar approaches as the USGS studies. We believe that the USGS study plan will provide a consistent core of basic data and process-oriented research that will benefit all other studies. We are working closely with researchers from the USFWS, the University of California, and other organizations. Fortunately, the strong sense of urgency to resolve the issue of agricultural drainage in the San Joaquin Valley has resulted in a number of complementary studies by scientists from several public and private organizations which will provide the responsible managers the bases for understanding and, ultimately, solving the problem.

GEOCHEMICAL RESEARCH, SOURCES AND DISTRIBUTION OF SELENIUM, WESTSIDE OF SAN JOAQUIN VALLEY

Ivan Barnes

INTRODUCTION/BACKGROUND

The primary sources of selenium found in the drainage water of the western San Joaquin have not been identified, but are believed to be minerals contained in marine rocks that underlie the Central Valley and that outcrop in the Coast Ranges to the west. Selenium is thought to be incorporated as a substitute for sulfur in the mineral pyrite. This study will examine the weathering, mobilization and transport of selenium from the Coast Ranges to the Valley.

The identification of elevated levels of selenium in the drainage waters of the western San Joaquin Valley has resulted in a need to identify the mobilization and transport of selenium from both primary and secondary sources. Such information will provide the basis for developing and evaluating various management alternatives to the present irrigation practices.

GOALS/OBJECTIVES

The objectives of this proposed study are to identify the sources of the selenium, the minerals in which it occurs, the pathways by which the selenium moves and the mechanisms of these pathways.

APPROACHES/METHODS

The approach will be mineralogic, chemical, and isotopic. Although the segments seem independent, they are mutually supportive and are a single integrated attack that must all be done simultaneously. The minerals will be characterized by optical methods where possible and by x-ray diffraction. The x-ray diffraction analysis is a nondestructive method. For coarsely crystalline minerals x-ray diffractometry will be a confirmatory method but for fine-grained materials will be the method of choice for characterization.

Chemical analysis of minerals will be made as a third confirmatory method and will show which minerals bear the selenium. This is necessary because the solution-precipitation behaviors are different for different dddérals. This in turn has major effects on paths by which selenium moves.

The isotopic study will be diagnostic of selenium sources and sinks independent of chemical speciation. Following selenium through different oxidation states may be difficult in the absence of stable selenium isotope ratio determinations. This method will remove any residual uncertainty in the ultimate source and fate of selenium.

BUDGET

The work described will take 3 years to complete. The isotope chemist, analytical chemist, and two geologists compose an integrated team that operate simultaneously on different aspects of the work. Approximately 4 man years per year will be required.

	FY 1985	FY 1986	FY 1987
Cost (X$1000)	598	295	235

SPATIAL AND TEMPORAL DISTRIBUTION OF SELENIUM AND OTHER TRACE ELEMENTS IN THE SOILS AND SHALLOW GROUND WATER OF THE WESTERN SAN JOAQUIN VALLEY

S. J. Deverel, Ron Tidball (Geologic Division), and Roger Fujii

INTRODUCTION/BACKGROUND

Data now available provide partial answers to questions concerning the mobility and spatial variability of selenium and other trace elements (As, B, Cd, Cr, Cu, Hg, Li, Mn, Mo, Ni, Pb). On a regional scale, an initial sampling of the shallow ground water in the western San Joaquin Valley (Deverel and others, 1984) showed that the highest selenium concentrations appear to be associated with the Panoche, Little Panoche, and Cantua Creek alluvial fans. Preliminary data from detailed soil and ground-water sampling in three tile-drained agricultural fields show a high degree of within-field variability in selenium concentrations.

The working hypothesis of this study is that selenium in ground water behaves primarily as a conservative constituent associated with soluble sulfate salts. An understanding of shallow ground water and soil chemistry is essential management of irrigation practice on a local and regional basis.

GOALS/OBJECTIVES

The objectives of this study are: (1) An assessment of areal, vertical, and temporal variability of selenium and other inorganic trace elements in the shallow ground water of the western San Joaquin Valley on regional and agricultural-field scales; (2) an examination of the chemical nature of the solid phase of selenium in the soils and sediments and its relation to concentrations observed in the shallow ground waters; and (3) an investigation of the relationship between the shallow ground-water chemistry and flow system within artificially drained agricultural fields in the western San Joaquin Valley.

A primary goal of this study is to provide an evaluation of comprehensive chemical data from over 100 shallow sampling holes in these fields, combined with associated soil sampling, and applying the tools of geostatistics and geochemical modeling, to lead to an improved explanation of the source of selenium in drainage water and what field-scale management actions may be beneficial on a regional basis.

APPROACHES/METHODS

Areal and depth distribution of trace elements in tiled fields at lower elevations has been partially completed. Monthly monitoring of selected sites is being conducted in cooperation with the Bureau of Reclamation. Three representative irrigated fields with selenium levels of 50, 400, and 4,000 ug/L are being studied, with detailed sampling of soil to the water table at more than 100 sites. Sampling of the shallow ground water at higher elevations is being conducted as part of the regional ground-water flow system study (Neil).

The areal and depth distribution of trace elements in soils is being evaluated for the western San Joaquin Valley on a one sample per square mile basis, with finer-scale sampling for analysis of variance. Samples are being taken of the surface, B horizon, and C horizon at each site. The first year is focused on the Panoche and Cantua alluvial fans, with other areas added over the following 3 years.

The chemical nature of selenium in the soils will be studied on selected samples using a variety of techniques, and will complement results of the related geochemical process study (Fujii, Deverel, and Wilson) to help define the solid phase/aqueous interactions. The mineralogy of selected samples will be determined by x-ray diffractometry to help identify pedogenic processes and geomorphic features possibly influencing selenium distribution.

One irrigated field on the Panoche fan with high selenium values will be intensively monitored through a piezometric network, monitoring of ground-water quality, hydraulic heads and unsaturated zone moisture contents to examine the relationship between ground-water flow and ground-water chemistry. This effort will be conducted with the regional hydrogeology study and modeling effort (Belitz and Page).

PLAN OF ACTIVITIES/BUDGET

Regional and field-scale ground water and soil sampling has been conducted in FY 85 and chemical analysis of soils and ground water is currently underway and will continue in FY 86 and FY 87. Solid phase determinations of selenium using x-ray, fluoresence, scanning electron microscope and electron microprobe and chemical extraction techniques has begun and will become a more important aspect of this project in FY 86, 87, and 88. Column studies will begin in FY 86 and continue through FY 89.

	FY 1985	FY 1986	FY 1987	FY 1988	FY 1989
Cost (X$1000)	590	520	450	450	200

OCCURRENCE AND TRANSPORT OF SELENIUM AND OTHER TRACE ELEMENTS IN THE SAN JOAQUIN RIVER

D. G. Clifton and R. J. Gilliom

INTRODUCTION/BACKGROUND

High concentrations of selenium and other trace elements have been detected in surface and shallow ground water of the western San Joaquin Valley. Natural drainage for the 1.2-million-acre western San Joaquin Valley is into the San Joaquin River. The river is utilized downstream for irrigation, wildlife habitat, and drinking-water supplies near the San Joaquin-Sacramento Delta, and it flows into Suisun Bay and San Francisco Bay.

This study addresses concerns about the effects of selenium and other trace elements that are present in agricultural drainage water on concentrations in the river and on loading to the Delta and San Francisco Bay. In cooperation with the related study of hydrogeology (Belitz and Page) and studies by the State of California, the sources of selenium and other trace elements will be addressed.

This information will aid in estimating potential benefits of a completed San Luis Drain to the water quality of the river, and in estimating the implications of not completing the drain project.

GOALS/OBJECTIVES

The objectives of this study are to evaluate the following: (1) The frequency distribution of selenium and other trace elements in the San Joaquin River in relation to both time and location; (2) the mass transport of selenium and other trace elements by the San Joaquin River to the Delta on both seasonal and annual bases; (3) the loading of selenium and other trace elements to the San Joaquin River by direct measurement of drainage discharges; and (4) the spatial and temporal distribution of common aquatic plants and animals in perennial flow reaches of the San Joaquin River with respect to variations in stream temperature, velocity, and concentrations of major ions, nutrients, and trace elements.

APPROACHES/METHODS

The objective of assessing occurrence and transport in the San Joaquin River are met by the same data collection effort. The study will focus on the 194 river miles between the U.S. Geological Survey NASQAN station at Friant, below Millerton Lake where the river enters the San Joaquin Valley, and the NASQAN station near Vernalis, shortly before the river enters the Delta. Except for the Friant station, all sampling of the river will be between Mendota and Vernalis, the stretch of river adjoining the service area. The major east-side tributaries of the San Joaquin River—the Merced, Tuolumne, and Stanislaus Rivers—also need to be monitored near their points of discharge into the San Joaquin River because they dominate the flow of the San Joaquin into the Delta.

Six stations on the San Joaquin River, all with continuous discharge records, will be monitored. Additional existing stations near the mouths of the Merced, Tuolumne, and Stanislaus Rivers will also be monitored.

As supportive information for the occurrence and transport part of the study, and to determine the main sources of selenium and other trace elements in the river, drain discharges to the river from the service area will be inventoried and monitored. Discharge measurements and water-quality samples will be taken on a reconnaissance basis to identify the specific discharges that require monitoring. Initially, these will be sampled frequently to determine the temporal variability of flow and concentrations and then on a suitable, regular schedule during all parts of the year when drainage flow is significant.

PLAN OF ACTIVITIES/BUDGET

Data collection, with refinements over time, will be conducted through 1988. Data analysis and published reports are planned throughout the life of the project, with final reports in 1989.

	FY 1985	FY 1986	FY 1987	FY 1988	FY 1989
Cost (X$1000)	460	650	650	600	300

A PROPOSAL TO MEASURE RATE PROCESSES OF PHYTOPLANKTON FROM THE NORTHERN SAN FRANCISCO BAY ESTUARY

James E. Cloern and Sally Wienke

INTRODUCTION/BACKGROUND

The U.S. Bureau of Reclamation has proposed using a complex ecological geochemical model (HydroQual) to facilitate understanding the effects of San Luis Drain water on San Francisco Bay. Of particular concern is the fate and toxicological significance of accelerated selenium inputs to northern San Francisco Bay. One subcompartment of this model defines a set of processes related to phytoplankton, a biological community which: (1) Assimilates toxic trace elements (such as selenium) that are then made available to higher trophic levels (zooplankton, benthos, and ultimately fish and waterfowl); and (2) may itself become physiologically stressed if selenium concentration reaches a certain threshold. Simulation of phytoplankton dynamics requires biologically realistic equations that accurately predict rates of processes (growth, photosynthesis, respiration, selenium uptake, and assimilation) for a variety of environmental conditions. Previous efforts to simulate phytoplankton dynamics in northern San Francisco Bay have failed, in large part because important process rates have not been measured for phytoplankton communities endemic to this estuary. Existing ecological models use simple phytoplankton growth kinetics that may be applicable to lakes, but which clearly are inappropriate for this system.

GOALS/OBJECTIVES

The proposed research is designed to provide: (1) Measured rates of growth, photosynthesis, and respiration for most abundant phytoplankton species of northern San Francisco Bay; and (2) empirical models fitted to these data that should give substantially improved and biologically realistic quantification of these processes.

The development and use of this information is expected to allow better evaluation of the potential effects of San Luis Drain water on San Francisco Bay.

APPROACHES/METHODS

Three phytoplankton species (*Skeletonema costatum*, *Thalassiosira decipiens*, and a representative microflagellate) will be isolated from northern San Francisco Bay and maintained in unialgal cultures. Batch-culture experiments will be done in a factorial design to measure process rates under defined combinations of salinity, temperature, and irradiance. Response surfaces for each process and each species will then be defined by fitting measured rates to empirical functions. Growth, photosynthesis, and respiration rates will be measured, followed by subsets of the same measurements in cultures containing suspended particles to mimic the suspended particles of the estuary to determine whether association with particles alters rates of physiological processes.

A logical next step, not included in this study, would be to measure the influence of selenium on process rates for these same species.

PLAN OF ACTIVITIES/BUDGET

A period of 3 years is expected to be required to complete this work and develop a report.

	FY 1985	FY 1986	FY 1987
Cost (X$1000)	45	40	15

GEOCHEMICAL PROCESSES CONTROLLING SELENIUM MOBILITY IN SOILS OF THE WESTERN SAN JOAQUIN VALLEY

Roger Fujii, S. J. Deverel, and Steve Wilson (Geologic Division)

INTRODUCTION/BACKGROUND

The mobilization of selenium (Se) in the western San Joaquin Valley is not well understood. The mobility of Se in soils depends on the geochemical processes controlling its solid and solution phase species. Precipitation and coprecipitation of various forms of Se with iron minerals have been reported and/or hypothesized by various authors. Adsorption and desorption of selenite and selenate on soils, soil minerals, and organic matter has also been reported.

These studies have demonstrated the need to determine the solid phase associations of Se and the possible solid phases controlling Se solubility as a basis for understanding the processes of Se mobilization and movement in the western San Joaquin Valley.

GOALS/OBJECTIVES

The technical objectives of this study include: (1) Characterization of the solid phase association of Se in the soils of the study area and determination of the possible solid phases controlling Se solubility in these soils; and, (2) assess Se mobility in those soils and quantitatively evaluate the relative solubility and transport of different Se species in the soil solution. Although Se is of primary concern, other trace elements will also be examined.

The long-term goals of this and related geological survey studies by Deverel and others, Oremland, and Nordstrom include a full understanding of oxidation/reduction transformations of Se, and the kinetics of these reactions as affected by redox conditions, microbial influences and other factors. This information, when integrated with additional information on ground-water flows, irrigation practices, drain water disposal options and costs will aid in decisions related to the management of Se in the agricultural soils and drainage waters in the area.

APPROACHES/METHODS

Solid phase control of Se solubility must be characterized in order to understand and model Se transport in soils. Chemical similarities between sulfur and Se coupled with the relative abundance of soluble sulfate salts suggest the possibility that Se may be coprecipitated with evaporite minerals present in these soils. A technique of selective dissolution of soil and sediment fractions will be applied to selected western San Joaquin Valley soils high in Se. The dissolution technique consists of sequential extractions of soil or sediments with various reagents to determine the associations of Se with other elements and minerals.

Partitioning of soluble Se in the soil solution is also necessary information to understand and model Se transport in soils. Saturation extracts of high Se soils will be analyzed for total Se, selenate and selenite. Organic Se concentrations in the extracts will be assumed equal to the difference between total Se and selenate plus selenite. Transport of Se will be evaluated in a series of soil column experiments.

PLAN OF ACTIVITIES/BUDGET

The first year's activity is mainly sample collection and methods development for the dissolution studies and analysis of Se species. The second year will focus on dissolution studies, followed by column studies.

Cost (x $1,000)

FY	1985	1986	1987	1988	1989
	250	250	250	250	200

SELENIUM SPECIATION AND REDOX PARAMETERS
A Proposal for Studies on Water Quality in the San Luis Drain Service Area (SLDSA)

D. K. Nordstrom

INTRODUCTION/BACKGROUND

Drainage water in the western San Joaquin Valley (WSJV) with high concentrations of selenium (Se) had not been characterized for specific chemical forms or species of Se. The speciation of Se greatly alters its mobility and toxicity in natural waters. Therefore, it is very important to determine the species of Se at important points in the cycling of water throughout the WSJV. Dissolved Se can exist as selenide (2-), selenite (4+), selenate (6+) and organoselenium compounds, especially methylated Se. Reliable methods for the determination of selenide, selenite, selenate and methylated Se have been developed. Dissolved Se may also react with reduced sulfur to form selenosulfide compounds and in the presence of organics there is the possibility of organoselenosulfur compounds forming. Many Se compounds are likely to be toxic and volatile and could be of critical importance if found in the WSJV, especially in Kesterson Reservoir where high organics and strong reducing conditions favor the formation of organoselenosulfides.

The information developed during the course of this study can be used in conjunction with other studies on soil and ground water in the WSJV, to assess Se mobility and toxicity which could result from proposed management alternatives.

GOALS/OBJECTIVES

The main objective is to determine the dominant species form of Se in key portions of the WSJV, along with other redox-sensitive parameters, and to interpret the potential equilibrium and kinetic processes that control the speciation. The longer term goal is to provide key information which will be of use in the decisionmaking process for evaluating drainage water treatment and/or disposal alternatives.

APPROACHES/METHODS

Several sample preservation techniques will be tested and used depending on the constituent to be preserved. Onsite measurements of pH, dissolved oxygen, conductivity, platinum redox potential, and temperature will be obtained in cooperation with other field investigators.

Determinations of the redox parameters and platinum electrode potential will be made to more fully characterize the redox chemistry of these waters and to find any correlations which exist between redox species that could be used to identify important reactions. Major and trace element analyses will be obtained on the same samples for the purpose of chemical equilibrium computations and interpretations of ion pair reactions and possible solubility controls.

Data evaluation for interpretation will include use of existing computer programs to examine redox couples through equilibrium computations. Thermodynamic data evaluation will be conducted with other investigators on the work plan.

Other techniques will involve correlation plots between constituents likely to interact or to have similar chemical properties and ion ratios, as guides to the removal or assimilation of constituents through the drainage system.

PLAN OF ACTIVITIES/BUDGET

One year will be needed to conduct the initial setup and evaluation of the analytical techniques followed by testing and evaluation of preservation techniques and testing for possible interfering substances from waters containing agricultural wastes. The second year will be devoted to the collection and analysis of samples from several sites from the WSJV for the broad survey of speciation trends throughout the affected area. This step is expected to take about 1 year (FY 86-87). Followup fieldwork, data reduction, data compilation, equilibrium computations, interpretive procedures and reporting will complete the program and will take an additional 2 years.

Cost (x $1,000)

FY	1985	1986	1987	1988	1989
	113	68	72	67	70

AREAL AND DEPTH DISTRIBUTION OF THE SELENIUM AND OTHER TRACE ELEMENTS IN THE REGIONAL GROUND-WATER AQUIFERS OF WESTERN SAN JOAQUIN VALLEY

J. M. Neil

INTRODUCTION/BACKGROUND

Little is known about the areal and depth distribution of the chemical constituents, particularly trace elements, in the regional ground-water aquifers of the western San Joaquin Valley. Several investigators conducted and interpreted water quality surveys in the late 1960's prior to a major change in irrigation practices due to the completion of the San Luis Canal. A water quality survey for the entire valley was also prepared as part of the Central Valley RASA in 1982. These reports contain few trace element data (NO-3, F, As, Fe and Mn). Detailed information on the distribution of potentially toxic trace elements in the regional aquifers is essential for water management in the area. More comprehensive trace element data may provide insight into the sources, sinks, and transport mechanisms for the chemical constituents found throughout the aquifer system and in ground-water discharge areas in the valley trough.

GOALS/OBJECTIVES

The technical objectives of this study include: (1) An assessment of the areal distribution of chemical constituents in the alluvial fans of the western San Joaquin Valley ground water where water levels are generally 50 feet or more below th land surface; (2) an assessment of the areal distribution of chemical constituents in the regional aquifer above and below the Corcoran Clay aquitard, to and at depths to 700 feet throughout the western San Joaquin Valley; (3) an evaluation of ground-water quality in the western San Joaquin Valley in relation to other areas of the Valley; and, (4) identify changes in water quality due to past stresses on the aquifer and/or to recharge or leakage from the shallow ground-water bodies.

The longer term goal is to develop an understanding of the controls on the regional ground-water chemistry. Such an understanding will, with other studies in the area, provide information for water management decisions in the region.

APPROACHES/METHODS

To supplement new and existing data for western San Joaquin Valley aquifer assessment, additional shallow- and deep-observation wells will be drilled. Shallow wells will be drilled at the center and heads of fans, and four sets of deep wells will be drilled along a presumed radial flow path on the Panoche Fan. These sets of three wells will permit sampling just above and below the confining Corcoran Clay layer, as well as sampling at an intermediate depth between the shallow water bodies and the top of the confining layer. Future drilling site selection and goals will be strongly dependent on the results of the drilling and sampling this year.

The aquifer assessment will address changes in water quality by comparing the file data with the new data and will attempt to identify the causes of the changes by modeling with an equilibrium model such as WATEQF. Results from other, related studies will also be used in this effort.

PLAN OF ACTIVITIES/BUDGET:

The initial effort of the first 2 years will be weighted heavily towards data collection and tabulation, and the last 2 years will be mostly involved with data analysis and report writing. The middle year (third) will be a transition from the collection effort to the analysis and report writing effort.

Cost (x $1,000)

FY	1985	1986	1987	1988	1989
	364	350	350	350	100

HYDROGEOLOGY OF THE WESTERN SAN JOAQUIN VALLEY

K. R. Belitz and R. W. Page

INTRODUCTION/BACKGROUND

The occurrence and movement of selenium (Se) in the western San Joaquin Valley is related to the movement of ground water, both locally and regionally. Therefore, it is important to understand the ground-water flow system which has been characterized as a lower confined zone and an upper unconfined/semiconfined zone separated by the Corcoran Clay Member of the Tulare Formation. The occurrence of a shallow water-bearing zone in the uppermost part of the aquifer system. This zone is probably less permeable than the sediment below it, as indicated by soil surveys, and probably lies within 5 to 25 feet of the surface. The interaction of the uppermost part of the aquifer system with the deeper parts, and the nature of the shallow-flow system in drained agricultural fields has important management implications.

GOALS/OBJECTIVES

The objectives of this study include: (1) The development of a geologic framework of the western San Joaquin Valley as a basis for understanding the regional hydrology; and, (2) a quantification of the rate and direction of ground-water flow in selected parts of the aquifer system. The longer-term goal is to develop an understanding of the subsurface transport mechanisms of Se and other chemical constituents. This will contribute to a basis for making informed land use and irrigation management decisions.

APPROACHES/METHODS

Several work elements will be undertaken to meet the above objectives, including: (1) Compilation and syntheses of all geologic reports on the west side of the San Joaquin Valley, (2) texture mapping, (3) mathematical simulation of the ground-water hydrology, and (4) field investigations, which will include drilling of test holes and observation wells. Several scales of analyses may be necessary for understanding the role of ground water in the transport of Se and other chemical constituents. Three preliminary scales have been chosen for investigation:
(1) Agricultural field, (2) alluvial-fan, and (3) western San Joaquin Valley study area.

PLAN OF ACTIVITIES/BUDGET

Data gathering and reduction will dominate the first year and part of the second year. Depending on results, drilling may continue into the third and fourth years. Data analysis, map preparation and ground-water modeling will dominate part of the second and most of the third years.

Activities during the fourth and fifth years, which will include report writing and may include a solute- transport model, will depend on the findings of this study and other related studys.

Cost (x $1,000)

FY	1985	1986	1987	1988	1989
	510	650	550	350	200

MICROBIOLOGICAL ASPECTS OF THE BIOGEOCHEMISTRY OF SELENIUM

Ronald S. Oremland

INTRODUCTION/BACKGROUND

There is evidence which suggests that microbial activities govern, to some extent, the chemical speciation of selenium (Se). A variety of microorganisms have been studied which perform numerous chemical transformations upon this element. Despite the fact that Se is chemically similar to sulfur, the involvement of sulfur-cycle microbes in the biogeochemistry of Se has not been adequately studied. This is important because the chemical speciation and abundance of Se in the western San Joaquin Valley appear to correlate well with that of sulfur. The mobilization of insoluble metal selinides found in the region may be carried out by microbial oxidative reactions. An examination of microbial influence on Se mobility will provide a basis for decisions for erecting and handling Se-rich sediments as part of the drain water management program.

GOALS/OBJECTIVES

This study will examine separate facets of microbial influence on Se mobility, including: (1) An assessment of a variety of sulfur-respiring bacteria's ability to immobilize Se through reduction; and, (2) an examination of reductive methylation of inorganic forms of Se in anaerobic environments. The long-term goal of this study is to provide body of information which, with the results of related studies, will allow prediction of the behavior of Se in different environments.

APPROACHES/METHODS

These studies will be undertaken under laboratory conditions using samples from the western San Joaquin Valley as well as Se-spiked samples. Concurrently, in situ estimates of reaction rates will be made at various locations in the field.

PLAN OF ACTIVITIES/BUDGET

The estimated duration of this study is 5 years, at an annual cost of $70,000.

Cost (x $1,000)

FY	1985	1986	1987	1988	1989
	70	70	70	70	70

TOXIC METALS IN BENTHOS AND SEDIMENTS IN SUISUN BAY

Samuel N. Luoma

INTRODUCTION/BACKGROUND

Benthic organisms and bottom sediments efficiently sequester trace metals in estuaries. Sediments are a consentrated pool of many metal and changes in concentrations are useful in identifying changes in inputs to an estuary.

At present, little is known about existing concentrations of trace metals in either sediments or benthic organisms in the Suisun Bay region being considered as a drain discharge site. In order to assess any future impacts on the bay from the disposal of agricultural drainage water, trace element concentrations and fluctuations needs to be characterized as they currently exist in the potential drain water plume areas.

GOALS/OBJECTIVES

The objective of this study is to obtain and analyze monthly samples of sediments and an indicator organism (the filter feeding bi-valve *Corbicula flaminea*) in the region of the potential site of the San Luis Drain discharge. A primary goal of the study is to provide a workable methodology to minimize the effect of ancillary variables on the assessment of changes in metal input into the estuary.

APPROACHES/METHODS

Samples will be collected by U.S. Bureau of Reclamation personnel on a monthly basis. Pretreatment and analyses will be conducted by U.S. Geological Survey personnel.

Sediment and *Corbicula* samples will be taken at 8 stations in Suisun Bay and the San Joaquin River at Delta-Mendota. Metal concentrations in sediments and benthic organisms are affected not only by changes in metal inputs, but also by changes in a wide range of unrelated environmental variables. Because of these influences, a number of physical, chemical and biological techniques in conjunction with statistical evaluation will be used to compensate for these independent variables to make comparisons of estuarine and riverine metal inputs and assessments of changes during and between annual cycles.

Metals and metalloids included for assessment are iron, manganese, silver, cadmium, copper, lead, zinc, selenium, arsenic, and mercury.

PLAN OF ACTIVITIES/BUDGET

Samples will be collected for a minimum of 2 years, and possibly for as long as 4 years, depending on the results of analyses. During the final year of the study, now anticipated to be FY 88, data interpretation and final report production will be completed.

Cost (x $1,000)

FY	1985	1986	1987	1988
	121	100	100	35

State of California

Studies currently proposed by State agencies and approved by the Governor are as follows:

California Department of Water Resources (DWR)

- Establish, pursuant to an interagency agreement with the University of California, a comprehensive service laboratory for analysis of water, soil and air systems associated with agriculture. Included here is augmentation of DWR's monitoring program, desalting program, and laboratory capability.

- Study the feasibility of operating, under controlled conditions, a water delivery system in the Grassland Water District in order to minimize the impacts on water quality in the San Joaquin River and ground-water supplies and on the habitat in the District.

- Purchase water from the Federal Central Valley Project to provide water as part of a study to improve water quality in the San Joaquin River.

State Water Resources Control Board

- Provide statewide survey of 12 elements, including selenium, to determine the effects on the environment and the public health and determine necessary protective actions, expand laboratory capacity to meet ongoing needs, and survey of San Francisco Bay.

University of California

- Short-term research to establish the magnitude of the current salinity, drainage and toxicity problems in the San Joaquin Valley; to evaluate existing information on the accumulation of constituents of concern in the food chain.

APPENDIX C

SAN JOAQUIN VALLEY DRAINAGE PROGRAM
OVERALL BUDGET SUMMARY

Revised 7-19-85
Page 1 of 2

SAN JOAQUIN VALLEY DRAINAGE PROGRAM PROPOSED BUDGET

(in thousands)

Item	FY 85	FY 86	FY 87	FY 88	FY 89	FY 90	Total
I. STUDY TEAM							
Alternative Analysis/Plan Development	--	2,000	2,000	2,000	2,000	1,000	9,000
II. NATIONAL ACADEMY OF SCIENCES	136	150	150	150	150	--	736
III. BUREAU OF RECLAMATION							
Treatment/Disposal	350	2,500	2,500	2,000	250	--	7,600
On-Farm Mnagement	100	1,000	1,000	1,000	1,000	--	4,100
Social Assessment	50	300	300	300	80	--	1,030
Economic Investigation/Analysis	90	800	800	500	250	--	2,400
Financial Investigation/Analysis	--	200	200	200	250	--	850
Regional Economic Impact	10	200	200	100	40	--	550
Environmental Studies/Impact Studies	50	700	1,000	1,000	250	--	3,000
Public Involvement	50	350	350	200	100	--	1,050
Subtotal	796	8,200	8,500	7,450	4,370	1,000	30,316

SAN JOAQUIN VALLEY DRAINAGE PROGRAM PROPOSED BUDGET

Item	FY 85	FY 86	FY 87	FY 88	FY 89	FY 90	Total
			(in thousands)				
IV. U.S. GEOLOGICAL SURVEY							
Spatial and Temporal Distribution of Trace Elements	760	670	600	600	150	--	2,780
Geologic Sources of Selenium	--	295	235	--	--	--	530
Geochemical Processes	315	420	410	410	200	--	1,755
Hydrogeology	285	450	350	150	100	--	1,335
Kesterson Geochemistry and Microbiogeochemistry	437	359	420	319	--	--	1,535
Bay-Delta Studies	166	133	65	35	--	--	399
San Joaquin River--Occurrence and Transport of Trace Elements	460	735	700	600	300	--	2,795
Subtotal	2,423	3,062	2,780	2,114	750	--	11,129
V. U.S. FISH AND WILDLIFE SERVICE							
Aquatic Monitoring	64.4	449.0	201.6	104.4	--	--	819.4
Toxicity of Contaminants	102.7	407.6	680.0	338.5	--	--	1,528.8
Bioaccumulation of Contaminants	--	417.6	311.3	268.8	--	--	997.7
Uptake and Loss Rates	117.3	293.0	271.0	184.0	--	--	865.3
Waterfowl Tolerance of Chronic Exposure	105.0	171.0	174.0	74.0	--	--	524.0
Uptake and Effects of Contaminants	42.6	267.6	304.0	304.0	98.8	88.6	1,105.8
Interactive Effects of Contaminants	49.2	146.9	189.8	55.8	54.2	--	495.9
Development of Capability to Predict Contaminant	118.2	322.4	218.2	143.8	--	--	802.6
Geographic Information System	--	676.9	643.8	536.1	291.9	291.9	2,440.6
Grasslands Study	462.9	520.8	--	--	--	--	983.7
Hazing Program	345.2	345.2	345.2	--	--	--	1,035.6
Contaminant Analyses of Food Chain	39.9	--	--	--	--	--	39.9
Shorebird Reproduction	7.7	--	--	--	--	--	7.7
Bird Condition and Health	5.5	--	--	--	--	--	5.5
Subtotal	1,460.6	4,018.0	3,338.9	2,009.4	444.9	380.7	11,652.5

Mr. **Brown**. Thank you very much, Mr. Broadbent.

Mr. **Broadbent**. As it is right now, recognizing that it is tentative because it hasn't had the full review of the National Academy.

Mr. **Brown**. In S. 1157, of course, repayment of that fund, those funds in S. 1157 would be by, it appears, either the Westlands Water District or perhaps the Central Valley project as a whole. Now, these are study funds.

Have you made any tentative identification as to who would pay for the Kesterson cleanup funds as opposed now to the study funds?

Mr. **Broadbent**. I think that would be included in our proposed legislation. We aren't there yet.

Senator **Murkowski**. I have no further questions, Mr. Broadbent. I appreciate your candidness with both myself and Mr. Brown, we will be pursuing some of your not recommendations but attitudes toward the written recommendation with regard to the feasibility study, and maybe we can settle this out of court. I don't know. I hope maybe we won't have to extend the bureaucracy to even greater efforts by putting off the decisionmaking process with an extended study period.

But again, I won't belabor that, but we will do that in our markup to some extent.

I am aware that Senator Wilson is here. I have talked to Senator Wilson, and Senator Wilson is our next witness.

Thank you.

Mr. **Broadbent**. Mr. Chairman, we still have testimony on two other bills, but we would be glad to wait or also just submit it for the record.

Senator **Murkowski**. Well, I suggest we accommodate Senator Wilson. Then I will give you some time to perhaps reconsider some of your testimony.

You might want to get together out in the hall and change it.

Senator Wilson, we have had some of the representatives of the administration present their position, which has been a little like quicksand, and we thought that we might give them a little breathing spell and call them back.

Senator **Wilson**. I hope I didn't cut short the opportunity that they have had to clarify it.

Senator **Murkowski**. Thank you, Senator Wilson. We look forward to your testimony. We have already had testimony on the legislation before us from your colleagues, Senator Cranston, Senator Pressler, and Senator Abdnor, who also testified on various aspects of the proposed bills which are before us, S. 1131, S. 1157, S. 1171, and S. 1192.

You may proceed at your leisure.

STATEMENT OF HON. PETE WILSON, A U.S. SENATOR FROM THE STATE OF CALIFORNIA

Senator **Wilson**. Thank you very much, Mr. Chairman. I am very grateful for the opportunty to appear here today.

There are few subcommittees of the Congress that have as much direct relevance to California as does this one, and I am much appreciative of the time the chairman has devoted to water and power issues as they relate to California.

Today I am here to address three bills, two of which relate solely to California, the Coordinated Operation Agreement, and the Kesterson Reservoir Cleanup Authorization, and one which is crucial to California but also applies to all 17 of the Western Reclamation States. I am speaking, of course, of the legislation to reauthorize the Small Reclamation Projects Act.

First, the Coordinated Operation Agreement, the COA, allows for the coordination of the operations of two major water projects for California, the State Water Project and the Federal Central Valley Project. It has been effectively 25 years in the making. Now that we have it, Congress I hope will act promptly to codify it and actually allow it to work.

What will the agreement do? First, the Bureau of Reclamation will be required for the first time in the history of the Central Valley Project, to share with the State in the responsibility for meeting delta water quality standards as established by the State board.

The sharing formulas are contained in the Coordinated Operation Agreement are no small achievement. Much credit is due to the tireless efforts of the Federal and State negotiators in reaching this agreement. It resolves years of uncertainty as to what the obligations of the Bureau of Reclamation were, and it is clear now it has established the Bureau has ability in meeting and maintaining delta quality standards.

With this issue resolved, we can expect the Secretary of the Interior to lift the moratorium on new Central Valley Project Water sale contracts that has been in effect since 1978 when the COA negotiations began in earnest. This is the best of good news to California, especially when it is considered that almost 1 million acre feet of Federal water will now become available to be marketed to a willing buyer. The Bureau will sell some of its water to the State in exchange for being able to use some of the State's conveyance capacity in the aqueduct.

This is a welcome development, particularly to the metropolitan areas of Los Angeles and San Diego who are searching about for a way to compensate for their loss of Colorado River water to Arizona. The State will now have access to a considerable, if as yet undetermined, amount of water from Federal sources that it can make available to its Southern California customers.

It is precisely for this reason that I received letters of support for the Coordinated Operation Agreement from the city of Los Angeles, the county of Los Angeles, the city of San Diego, the Southern California Water Committee, city of Anaheim, the city of Fullerton, the county of San Bernardino, the Metropolitan Water District of Southern California and various other Southern California water agencies.

At this juncture I would like to emphasize a couple of points that would help to calm any fears about competing uses. Federal water sold to the State will be sold on an interim basis. That is, for 25 to 40 years it is my understanding that this water will be subject to recall to service Central Valley Project service area needs as they arise. I am informed that these needs will not mature for some time yet, and in any case, further conveyance facilities such as the proposed Mid-Valley Canal will have to be constructed before the Central Valley Project water users can avail themselves of this water.

Turning to the subject of contamination of the Kesterson National Wildlife Refuge by contaminated agricultural drain water, I have come here today to register qualified support for the administration's bill, S. 1157 that would authorize $12.6 million for the San Luis drainage studies in fiscal year 1986. My support is qualified in a number of ways.

I caution those in the administration that are dealing with this problem not to let the multiple agency approach to California's selenium crisis become an unworkable bureaucracy in and of itself. Bureaucratic delays have proven to be a problem in the last few months.

For example, I understand that the Bureau of Reclamation is just now going out to contract on feasibility studies to review two possible drainage disposal options, deep well injection, including the possible use of drain water for enhanced well and gas recovery, and treating drain water by reverse osmosis process to remove undesirable elements.

These studies should have been contracted weeks ago but have apparently been held up for lack of clearance delays by the interagency management team charged with responsibility over the Kesterson crisis.

While I fully support an interagency approach to this complex problem, nonetheless, an expeditious action to address what is an urgent situation should not be compromised.

The need for an interagency approach brings me to my next point. One of the most significant developments in recent weeks was the finding of dangerous selenium concentrations in agricultural drainage water serviced by the State water project. These findings were released on July 10 by the State Department of Water Resources based on drain water monitoring in Kern County, CA.

The significance of these findings should not be overlooked. We now know that the selenium problem in the San Joaquin Valley is not limited to 42,000 acres in Fresno County. We can hope that the selenium finds in Kern County are isolated, but it would be irresponsible to act on this assumption.

Until we know better, it is incumbent upon Congress and the State of California to devote sufficient resources to fully determine the extent of selenium contamination in the Central Valley now and in the future.

I name the State of California as a responsible party in this effort because that is exactly what the Kern County finds have dictated. Selenium in California is no longer exclusively a Bureau of Reclamation problem. Solving this problem will require the financial participation of the State. Section 3 of the administration's drainage study bill, S. 1157, authorizes the Secretary to receive funds from non-Federal entities to assist in financing of the drainage study.

I would urge this committee to change this language to require substantial State cost sharing on these studies before they begin.

After all, these studies will have applicability to both State and Federal water service areas, and if both benefit, both the Federal Government and the State should share in the costs.

I am sorry that the State felt that it was unprepared to appear here today to testify on this issue. If they had, I would have asked what plans they had for making a direct financial contribution to funding the selenium studies. If contamination of agricultural drain waters is as much a problem for the State water project as it is for the Federal water project, and all indications thus far are that this is indeed the case, then I think we have a right to demand that the State help shoulder the burden of funding the search for a solution.

I would add that the very $40 million study that needs to be funded is a study that the interagency review team has agreed to, a team on which the State is a major participant, quite properly.

The final point I would like to make with regard to the administration's drainage studies bill, S. 1157, is that I must reserve judgment on section 2 of this bill which requires that all funds authorized to be appropriated by this act be done so on a reimbursable basis. While I can certainly appreciate the rationale in requiring payment from those farmers who stand to benefit by these studies, it serves no purpose to impose what will undoubtedly be a major financial burden on an already depressed sector of the economy, namely, the agricultural community, without first considering another possibility.

That is, that I would propose that some consideration be given to devising a scheme whereby those costs associated with research on selenium and its effects in the Central Valley be made nonreimbursable, and that only those costs associated with the application of selenium control technologies be made reimbursable.

I would be happy to work with the committee and the Department of Interior in devising this kind of a scheme.

Senator MURKOWSKI. Thank you, Senator Wilson.

Senator WILSON. Mr. Chairman, I would only add my support for the Small Reclamation Projects Act reauthorization. On that point I would say only that for all intents and purposes, the program really is a loan program. Although grants are authorized, it is largely a loan program. I think that is proper, that it should be where possible, and failure to act expeditiously on this legislation will, as the committee doubtless knows, create planning problems in California and the 16 other reclamation States.

The Bureau informs me that while not all of the $600 million loan authority has actually been obligated, the approval of existing applications will likely cause the obligations of the remaining moneys by fiscal year 1986.

So in order to keep the Small Reclamation Projects Act on track, Congress needs to act now to allow potential loan applicants to plan for fiscal year 1986 and beyond.

Thank you very much, Mr. Chairman.

Senator MURKOWSKI. Thank you very much, Senator Wilson.

Senator Hecht, do you have anything?

Senator HECHT. No thank you, Mr. Chairman.

Senator MURKOWSKI. No observations or praise for your colleague from California?

Senator HECHT. Yes, I praise our distinguished junior Senator from California for his outstanding work in the U.S. Senate.

Senator MURKOWSKI. I suggest you quit while you are ahead.

Senator WILSON. I will quit while I am ahead, Mr. Chairman. I would ask further only that the statement of Carl Boronkay, the general manager of the Metropolitan Water District of Southern California in support of S. 1192, be placed in the committee's record.

Senator MURKOWSKI. Without objection.

[The prepared statement of Mr. Boronkay follows:]

Statement of
Carl Boronkay
General Manager
The Metropolitan Water District of Southern California
before
The Subcommittee on Water and Power
of the
Senate Committee on Energy and Natural Resources

July 16, 1985

The purpose of this statement is to support S. 1192, the Coordinated Operations Agreement negotiated between the United States Bureau of Reclamation and the California Department of Water Resources.

The Metropolitan Water District is responsible for importing approximately one-half of the water used in Southern California. Our service area contains approximately 13 million people, over half of the population of the State of California. We will not only have to provide for our still growing population, but also must compensate for Colorado River supplies that will be lost to Arizona.

One of Metropolitan's major efforts is to firm up the yield of the State Water Project. Metropolitan is the largest of the State water contractors, with an ultimate entitlement to nearly one-half of the project's yield. Even if we are successful in our other efforts, particularly on the Colorado River, we will need additional water from the State Water Project. We believe the Coordinated Operations Agreement is a major step toward providing a portion of that additional water.

A summary of the key provisions of the Agreement is attached to this statement. We endorse those provisions, believing that they represent in total a fair and responsible allocation of both the benefits and obligations of the operations of these two great water supply systems in the Sacramento-San Joaquin Delta. Beyond that, however, we see extensive long-term benefits to Southern California from this Agreement:

When passed by Congress, it will remove a long-standing area of contention and divisiveness between the United States and the State of California;

It provides a rational approach to meeting Delta water quality standards;

It will result in a substantial additional quantity of water for the State Water Project during dry periods, one-half of which will be available to Metropolitan;

It opens the way to the purchase of CVP water, on an interim basis, by the State Water Project, which will allow time for deliberate study and discussion of what additional facilities are needed for the State Water Project; and

Finally, it constitutes a major building block for the construction of a statewide consensus on solving the water needs of all of California.

Accordingly, Metropolitan urges immediate congressional approval of the Coordinated Operations Agreement.

# # #

Attachment

THE METROPOLITAN WATER DISTRICT
OF SOUTHERN CALIFORNIA

Summary of
State Water Project-Federal Central Valley Project
Coordinated Operations Agreement

In planning the State Water Project (SWP) some 30 years ago, California recognized the importance of avoiding confrontation with the federal Central Valley Project (CVP) over rights to surplus Delta waters. The United States and the State accordingly entered into a water rights agreement in 1960, which also required development of a mutually acceptable coordinated operation agreement for the two projects.

Ten years later, in 1971, California and the United States reached a tentative SWP-CVP coordinated operation agreement. Pending development of a final agreement and completion of necessary environmental documentation and Congressional approval, the parties have since then coordinated operation of the two projects by annual letter agreements.

The 1971 agreement allocated obligations between the two projects for protecting the Delta, and their respective use of surplus Delta water. Unfortunately, it based those allocations on construction of water development facilities planned in 1971, such as Auburn Dam and the Peripheral Canal, that have not yet been built; and on Delta outflow requirements which have now been determined inadequate. Those factors, together with operational experience over the past 14 years has demonstrated a need to change the 1971 agreement.

California and the Bureau of Reclamation have accordingly reached an agreement on those changes and incorporated them in the proposed Coordinated Operations Agreement (COA) now before this committee. In our view, the more important changes include the following:

1. Basing the calculation of water supply allocations on the basis of existing facilities only.

2. Defining surplus Delta water more accurately and allocating it more precisely between the CVP and SWP.

3. Requiring the CVP to meet State Water Resources Control Board (SWRCB) standards established in Delta Water Rights Decision 1485, thus insulating the SWP from the question of whether it would make up Federal deficiencies in time of shortages.

4. Enhancing the dry period yield of the SWP by approximately 200,000 acre-feet through better definition of surplus, and obtaining CVP agreement to meet Delta outflow standards.

5. Directing the parties to negotiate an agreement for the conveyance and purchase of CVP water to allow more efficient use of the two projects. Under that concept, California would convey CVP water through unused SWP capacity for CVP water users; and the United States would sell water which the CVP will not need over the next 10 to 30 years in order to augment the SWP dry period yield on an interim basis. That interim water could total as much as 500,000 acre-feet annually.

6. Providing a method for incorporating future changes in SWRCB Delta standards, under which the Federal Government may obtain a judicial determination of whether those changes are inconsistent with Congressional directives.

Senator MURKOWSKI. I might ask, are you interested in any long-term water source from my State of Alaska as an alternate contribution to the continued welfare of your State?

It does appear that you are searching all reasonable avenues for some relief, and having been in both San Francisco and Los Angeles last weekend, it seems the country is not only drying up, but burning up. I am wondering if you are looking forward to some long-range, rather extended projects in the future or if you feel that natural attrition in California will take care of itself.

Senator WILSON. Mr. Chairman, being a southern Californian, the mere sight of water makes me salivate, and we are desperately in need. In fact, I would like to take all three glasses, but——

Senator MURKOWSKI. We do not want the Senator salivating on television, certainly.

Senator WILSON. Mr. Chairman, I am not aware of any potential projects, but if the State of Alaska with its characteristic generosity wishes to offer California water, we would be more than pleased to talk to you about it.

Senator MURKOWSKI. Well, there is a firm in the State of California, which I am sure the Senator is familiar with, called Parsons, Parsons Engineering, which is an outstanding worldwide recognized engineering firm.

Senator WILSON. I have heard of them. They are the farm club for cabinet officers.

Senator MURKOWSKI. They are proposing a scheme that would bring water down through the Rocky Mountain Trench from the northern Yukon and northern Alaska to the Western States. It is a rather extraordinary scheme but could provide a tremendous resource of water. It may be something that you and I ought to talk about someday either in your State in the wintertime or my State in the summertime.

Senator WILSON. I like your timing.

Thank you, Mr. Chairman.

Senator MURKOWSKI. I wish you a good day.

Senator HECHT. May I go to your State in the summertime?

Senator MURKOWSKI. I welcome you, both of you. Our mosquitoes would welcome you.

We are going to get back to Mr. Broadbent who I believe is still with us, and he's going to be commenting on S. 1171 and 1192. We probably will try and not question you quite to the degree that we did previously because we have, I see, Mr. Brown has given me a second page of witnesses and I wasn't aware that there was a second page. As usual, he's up to his old tricks.

Please proceed, Mr. Broadbent.

Mr. BROADBENT. Mr. Chairman, the next bill is S. 1171, which is to amend the Small Reclamation Projects Act. I would like to have my statement entered into the record, if I might, and maybe just indicate to you that we support the enactment of the Small Reclamation Projects Act. We would ask that there be a change in the interest rate, and we would be pleased to work with the staff of the committee on a proposed amendment on surplus crops.

Senator MURKOWSKI. I appreciate that. That was my question.

Mr. BROADBENT. If I could, this chart indicates the expenditures for the Small Reclamation Projects Act. The dark green is the money that has already been spent. The program was started in 1959. It is a loan program repayable to the Federal Government.

There have been about $453 million expended at this time. The balance is obligated and will be spent over the next few years. The light green indicates what would happen if the $600 million were authorized. We are talking about probably over the period of the dark green an average expenditure of about $18 million a year by the Federal Government.

In the dark green it would be a little more of that and would take us into, the next 15 or 20 years of authorized projects under this loan program, and it is just to indicate that we are not asking for the money I think in any one year, but it is spread out over a number of years, and the repayment contracts, of course, are some of them as lengthy as 40 years, but we are trying to shorten—we have reduced the subsidy by shortening the repayment period, and many of them are much shorter today than they were when we first entered into the program.

It's a good program. It has been a lot of benefit. It has saved water. The program is used by a lot of irrigation districts to modernize their system, to put in conservation measures, water quality measures, those kinds of things that I think farmers and indeed this country need to do as water becomes a more precious resource.

And so we'd be happy to answer any questions, but in general we support the Small Reclamation Project Act and will be pleased to work with the committee on the amendments.

Senator MURKOWSKI. Of the amount, Mr. Broadbent, that has been appropriated, how much has been returned to the Treasury, do you know?

Mr. BROADBENT. I will have to submit that to you for the record. I would be happy to do it.

Senator MURKOWSKI. Anybody want to volunteer that?

Voice: About $30 or $40 million.

Senator MURKOWSKI. I'm sorry, would you repeat that?

Voice: About $30 or $40 million.

Senator MURKOWSKI. Have been returned to the Treasury?

Mr. BROADBENT. Most of these are long-term contracts, but there are repayment contracts being entered into, and we are told it's about $30 million or $40 million, but we will furnish the exact figure.

[The information follows:]

The amount of loan funds repaid and returned to the Treasury as of September 30, 1985, is $37,404,000.

Senator MURKOWSKI. These have had all appropriate studies in support of them?

Mr. BROADBENT. Yes. There is a study before a program like this is initiated, there's a full review program. The review program takes as long as a year or two before a loan application can be made and completed.

Senator MURKOWSKI. Is it necessary that a year or two elapse? Why does it take so long?

Mr. BROADBENT. Most of it is due to the fact that we have to have a loan approved, and then it has to have an appropriation, it has to be approved by Congress. Each loan must be in our appropriation bill so that in itself sets you kind of in a stage to get something like that done.

Mr. ATWATER. Mr. Chairman, it might be noteworthy, given our previous conversation, that you ought to be aware that in this case, in the small loan application, the applicants pay for all of the engineering feasibility in compliance with NEPA, all the project feasibility studies, and it usually averages between $200,000 and $400,000, and they pay for that all themselves up front before Congress and the administration goes through the process of approving the loan, and that is done by the private engineering firms typically.

Senator MURKOWSKI. Would you accept that if it were done by a private engineering firm in the case of the Gray Goose and Hilltop?

Mr. BROADBENT. Sure.

Senator MURKOWSKI. Would that not expedite it?

Mr. BROADBENT. Sure.

Senator MURKOWSKI. If it costs you $50,000, they would probably do it for $20,000. Well?

Mr. BROADBENT. You're right.

Senator MURKOWSKI. Well, why wouldn't we recommend to those proponents of the project that you certainly have no objection to them going out and doing a study and submitting it to you, and that would expedite the process?

Mr. BROADBENT. Heavens no, we would be happy to look at it.

Senator MURKOWSKI. You would just have to make a decision whether you agreed with it or not.

Mr. BROADBENT. Sure.

Senator MURKOWSKI. I don't know whether there's anybody left here, but I might suggest that as a way to expedite it.

Mr. BROADBENT. They're here.

Senator MURKOWSKI. They're here, OK. Maybe we've gotten that done, maybe not.

Mr. BROADBENT. The next bill, if there are no other questions——

Senator MURKOWSKI. No other questions.

Mr. BROADBENT. On the coordinated operation agreement, we've talked about Kesterson. Our final bill is the coordinated operation agreement. I would just like to indicate that these have been protracted negotiations between the Federal Government and the State of California, starting in 1979 or 1980, going on through 1979 and 1980 into this administration.

This is an agreement that has been jointly reached between the State and the Federal Government for the management of the water primarily that runs into what is called the delta from the Sacramento River. And the joint projects were built by the State and by the Federal Government.

We agree in this bill to meet the water quality standards that are presently set by the State of California, so-called D. 1485. We indicate that if those standards are changed we would reserve the right to either come back and ask Congress for the right to change it and meet those new standards or to litigate it.

You know, you could find yourself in a position, the State or the Federal Government which provides water, about 7 million or 8 million acres of water to farmers and municipal-industrial uses in California from the Central Valley project, could find itself in the position of not being able to meet those commitments because of too stringent standards, and we would reserve—the only thing that we asked in this contract which was reached in a negotiated agreement is the right to reserve it so that we can bring it back to Congress if there are major changes.

Senator MURKOWSKI. If the water would be purchased by the State from the Central Valley project and then sold to irrigators, would the acreage and pricing limitations of the Reclamation Reform Act apply?

Mr. BROADBENT. Yes.

Senator MURKOWSKI. Russ thought he had stumped you with that one.

Mr. BROADBENT. No; we looked at that.

Senator HECHT. I would like to point out that Commissioner Broadbent is from the great State of Nevada. He always does his homework very well.

Mr. BROADBENT. You weren't here when I got soft and fuzzy, Chick.

Senator HECHT. What's that?

Mr. BROADBENT. Senator Hecht, you weren't here. I kind of rolled around.

Senator HECHT. I've never seen you roll around in my life.

Any criticism I have ever heard has been that you're too direct.

Senator MURKOWSKI. I'm not going to press this one. I have no further questions for the witnesses.

Thank you, gentlemen.

Mr. BROADBENT. Thank you very much, Mr. Chairman.

Senator MURKOWSKI. We appreciate your testimony and your willingness to work within and without the system.

Our next panel consists of Mr. Richard Lloyd, vice president of the Hilltop Irrigation District, Chamberlain, SD, Mr. Edward R. Osann, director, Water Resources Program, National Wildlife Federation in Washington; and Mr. Stephen K. Hall, executive director, Land Preservation Association of Fresno.

I would ask that you summarize as much of your testimony as possible. I'm going to excuse myself for a few moments, and I would ask Mr. Russ Brown to continue here.

Excuse me.

I do remember you, Mr. Lloyd. It's nice to have you with us again.

Mr. LLOYD. Thank you, sir.

STATEMENT OF RICHARD LLOYD, VICE PRESIDENT, HILLTOP IRRIGATION DISTRICT, CHAMBERLAIN, SD.; ACCOMPANIED BY TOM TVEIT, TECHNICAL CONSULTANT, GRAY GOOSE IRRIGATION DISTRICT

Mr. LLOYD. Mr. Brown, I am Dick Lloyd with the Hilltop Irrigation District. I'm an owner-operator of the Hilltop, and I have with me a gentleman, Tom Tveit, who is a technical consultant with the Gray Goose Irrigation District who will also help in this testimony.

We also have copies of written testimony that we would like entered into the record.

Mr. **Brown**. They will be entered into the record without objection.

Mr. **Lloyd**. OK.

I don't know whether we should be addressing our comments to the committee or to Mr. Broadbent in this situation. I guess I will go on through and try to make a few points that maybe have not been covered in behalf of the irrigation districts insofar as the operators' standpoint on this situation.

The Senate bill 1131 would address primarily a situation that we have in the cost of electricity. Electricity used to lift the water and distribute it on the land has become the biggest single item in the cost of production of our crops, reflecting nearly a 300-percent increase in power costs since the district started operating. Our electric power is presently being purchased from a cooperative, an electric cooperative that purchase the bulk of our power out of State and delivers it to us through hundreds of miles of transmission lines and other costly facilities at a cost of around 6 cents a kilowatt.

Senate bill 1131 would allow us to purchase 2½ mill power presently being generated right in our backyard. It's within 20 miles of each of these projects. So you can understand our desires in trying to get to the 2½ mill power. It's very difficult for us to understand why the low-cost power promised for irrigation development in South Dakota would be denied these projects when many communities, municipal power suppliers, and cooperatives, as well as several Indian irrigation projects and State agencies are presently using this low-cost power source.

Other testimony given here today shows that we have the support of local and State agencies, as well as that of the electrical power supply people, and we ask that your committee would look favorably on Senate bill 1131 so that we can keep these projects in operation.

In regard to some of the comments that Mr. Broadbent has made, we have talked with our area director for the Bureau of Reclamation, Mr. Joe Marcott. We have invited him to come out to our projects and do any evaluation that they would like to do. These projects are in operation today. If he would come out and look, I think it would serve as its own testimony as to what we're doing out there in a very dry area. We're raising some very important crops that lend well to the problems in a dry area, and I think the fact that we have been in operation for several years is testimony in itself in that these projects will survive if we can get low-cost power to keep our pumps running.

I do appreciate the opportunity to come before this committee and thank you for your consideration of this proposed legislation.

[The prepared statement of Mr. Lloyd follows:]

JOINT STATEMENT OF

DICK LLOYD, HILLTOP IRRIGATION DISTRICT

AND

TOM TVEIT, GRAY GOOSE IRRIGATION DISTRICT

ON S. 1131

BEFORE THE

SUBCOMMITTEE ON WATER AND POWER RESOURCES

COMMITTEE ON ENERGY AND NATURAL RESOURCES

UNITED STATES SENATE

JULY 16, 1985

Mr. Chairman, this testimony is presented on behalf of both the Hilltop and Gray Goose Irrigation districts. Inasmuch as the State of South Dakota has already presented testimony regarding the Hilltop and Gray Goose legislation (S. 1131), our statement will be very brief. The Hilltop and Gray Goose Irrigation districts would simply like to participate in the Pick-Sloan program on the same basis as many other irrigators in the Missouri Basin today.

The 1985 growing season may be a critical year for a number of South Dakota farmers. In addition to the seriously depressed farm economy, we are experiencing one of the driest seasons in several years. Precipitation during the last three months has been less than 50% of normal. During the months of April and May, rainfall was minimal and temperatures were much above normal. The month of June was relatively wet compared to April and May, but still below normal, and now we are facing the typically hot and dry months of July and August. The drought this year will force many farmers into bankruptcy.

We are not asking you to control the weather and to make it rain. Fortunately, the Hilltop and Gray Goose farmers already have a drought relief program in place; it's called sprinkler irrigation. This sprinkler system utilizes the Missouri River for water supply purposes as intended under the Pick-Sloan program. We consider ourselves fortunate to be located immediately adjacent to the Missouri River, and we have long supported its multi-purpose development. Unfortunately, due to existing federal policies, we are in the ironic position of almost not being able to turn on our sprinklers and utilize the Missouri River reservoir system during a period when we need it the most.

The federal authorities that govern the Missouri River reservoirs have approved our use of reservoir water supplies, but will not allow us to utilize the Pick-Sloan irrigation pumping power generated by the Missouri River dams in order to operate our sprinkler systems. We have been told that only integrated Pick-Sloan irrigation units can obtain Pick-Sloan pumping power, and that we cannot become a Pick-Sloan unit because we have been financed by the wrong federal agency, i.e., the Farmer's Home Administration instead of the Bureau of Reclamation. We can literally see the Missouri River reservoirs and hydropower facilities from our farms but cannot fully use such facilities for their intended purpose. This situation seems terribly absurd.

Some individuals have suggested that our request to become an integrated Pick-Sloan unit should be denied because we did not follow the traditional Bureau of Reclamation development process. Instead, we retained our own qualified engineering firm and obtained a Farmer's Home Administration loan at 5% interest to finance the construction of our projects. In this manner, we have been able to develop a more cost-effective system and we are repaying the federal government with interest. This approach should be commended, not held against us. If we had utilized the Bureau of Reclamation program, we would probably still be engaged in lengthy study efforts. The Pick-Sloan program has been in effect for over 40 years and the Bureau of Reclamation has yet to irrigate one acre from the Missouri River through Pick-Sloan in South Dakota. Such tradition we can do without.

Other individuals have suggested that our request to become an integrated Pick-Sloan unit should be denied because our lands could not be certified for long-term irrigation purposes. Actually, there are many other farmers in South Dakota that have been irrigating soils similar to our lands for 30 years and have yet to experience any serious problems. These irrigators are using relatively poor quality groundwater--the only water supply available to them--and have installed minimal drainage measures. If these lands are capable of sustaining irrigation water application, then the Hilltop and Gray Goose projects should certainly be able to do likewise especially considering the excellent quality of Missouri River water.

We urge you to allow us to utilize the Pick-Sloan program for the basic purposes intended by Congress when the Pick-Sloan program was approved over 40 years ago. We urge you to approve S. 1131.

Mr. BROWN. Thank you very much, Mr. Lloyd.

Mr. Tveit, do you have a statement or are you here counseling Mr. Lloyd?

STATEMENT OF TOM TVEIT, TECHNICAL CONSULTANT, GRAY GOOSE IRRIGATION DISTRICT

Mr. TVEIT. Mr. Brown, I do have a statement, and as you said, I serve as a consultant to the operators in the Gray Goose Irrigation District. I also operate two quarter sections in that district and so can speak from a couple of different angles, and I would like to make a couple of short statements primarily in response to other testimony that has been given.

First of all, Mr. Broadbent seems to feel that South Dakota has not shown an interest in irrigation development, and I submit that the farmers who are in these two districts have demonstrated a great desire for irrigation development, and they put their own money on the line and developed these projects with the help of a loan from FHA, and now find themselves in a position of not being able to continue because the cost of their power is becoming very prohibitive.

To me that shows a great deal of interest and desire to maintain their farms in the way that they would like to.

I would also like to answer the question of feasibility studies and other types of studies that are required by the Bureau of Reclamation.

At the time that these two projects were developed I was an employee of a company called Technical Consultants. This firm had two branches, one engineering, the other agricultural and agrinomic consulting, and as such was involved in some of the preliminary studies that went into these two projects.

And I can tell you at this time that the feasibility of each project was done and done well, and that it showed that these projects were both very feasible and that the only question that was raised was the possibility that there may be some drainage problems down the road.

And the only reason that there was a question at that time was because these projects were developed for sprinkler irrigation, and the Bureau of Reclamation could not supply us with any criteria that said whether or not sprinkler irrigation would require drainage at some time.

As a result of this, I have taken many soil samples each year to determine whether we have a salt buildup in the soil and to determine whether we have a water table buildup in the soil, and after 7 years of operation on the Gray Goose project, I find neither of these things happening.

And my conclusion at this point would be that with it being sprinkler irrigated, it's being handled very well, and that the project should be able to continue as it is for as long as the equipment lasts and that there are people out there to farm it.

That is I guess the extent of what I have to say.

Mr. BROWN. Thank you, Mr. Tveit.

Mr. Lloyd, in your discussions with Regional Director Marcott, has he informed you of the acreage limitations and pricing restrictions of the reclamation law?

Mr. **Lloyd**. Yes; the acreage limitation, I think you are talking about the 960-acres limitation with a Bureau project, and there is no problem with that in either of these projects.

Mr. **Brown**. How many farms are there in the two projects?

Mr. **Lloyd**. We are talking roughly of about 20 family sized farm operations in these two projects.

Mr. **Brown**. Do most of the landowners operate their own farms or live in the area?

Mr. **Lloyd**. I would say that most of them do. There is a little of that that is being rented. I don't know Tom, can you answer that?

Mr. **Tveit**. In terms of Gray Goose, there are, as I said, two quarter sections that I operate. One of them I operate as a result of a bankruptcy. The resident landowner could not continue, filed chapter 11 bankruptcy, and the bankruptcy court appointed me trustee to operate that land for the benefit of the creditors. In the other case there is one quarter section that I farm for a woman who lives in California who inherited the land from her father. So it is still a family-owned piece of land.

Other than that, there are no nonresident landowners. All the farmers are owner-operators.

Mr. **Brown**. I know that this is a difficult question to respond to, but have all of the landowners in the two projects been informed of the rules and regulations under reclamation law?

Mr. **Lloyd**. I guess the only way I can relate to that, and Tom may have to address it on the Gray Goose side, but I had reviewed all the rules and regulations in the Small Projects Act that has been discussed here this afternoon, and we'd also support that program. But we have discussed that with our members in the Hilltop project.

Now, I don't know about the Gray Goose people, but along the same lines, the Small Projects Act under the Bureau of Reclamation, I think we've done most of those things that they've required in that program insofar as paying our own engineering fees and feasibility studies and so forth. We've done that. But I can't answer you 100 percent as to how knowledgeable the other members would be on that, but we have discussed it.

Mr. **Brown**. Do you have available in your files or records copies of the engineering reports, the soil sampling efforts that were undertaken during the initial planning of the two irrigation districts?

Mr. **Lloyd**. Yes, sir.

Mr. **Brown**. Could you make those available to the Bureau of Reclamation?

Mr. **Lloyd**. Sir, we can do that.

Mr. **Brown**. Thank you very much.

Mr. Osann?

STATEMENT OF EDWARD R. OSANN, DIRECTOR, WATER RESOURCES PROGRAM, NATIONAL WILDLIFE FEDERATION

Mr. **Osann**. Thank you.

For the record, my name is Edward Osann. I'm the director of the Water Resources Program for the National Wildlife Federation. I have a written statement which I have submitted. I will not attempt to read it in its entirety.

I would just like to say that we're not here to dispute the merits or the viability of the two projects that are in question. The districts may well have a good case to be made for integration into the Pick-Sloan program and access to the benefits that flow from such a designation including the availability of very low cost power. The purpose of our testimony on this legislation is to call attention to the committee of the repayment and marketing problems and ratesetting problems related to Pick-Sloan as a whole.

It's been a number of years now since the Department of the Interior's own Office of Audit and Investigation concluded that the Pick-Sloan accounts essentially were in a shambles. To quote from the interior audit, they noted that the financial posture of Pick-Sloan is at best based upon an uncertainty. At worst, it is based upon an unreality. The net effect that no one knows within reasonable limits of accuracy what rates to charge power users and M&I water users to repay Pick-Sloan costs.

This of course goes to the question of ultimate development as a basis for ratemaking and marketing within the Missouri Basin.

For all we know, 2½ mills may not be the correct rate for power for irrigation pumping. Now, if it is subsequently found that this is not the correct rate and the rate is substantially higher, as it well may be, the committee should bear in mind that pumping, or power for pumping for irrigation purposes is considered irrigation under reclamation laws, it's allocated to irrigation under reclamation law, and as such, it is subject to ability to pay determinations by the Secretary of the Interior.

Now, if the rates which now appear to be such a bargain ultimately prove to be burdensome, the Secretary could make the determination that those costs should be assisted from commercial power revenues. However, under current ratemaking procedures, that assistance is not rendered until after the payout period of commercial power.

So we have the prospect of additional repayment obligations being layered on to the Pick-Sloan program and a further stretchout of an already tremendously attenuated repayment schedule for the project and the program as a whole.

That is the upshot of our concern. It does not pertain to the merits of the Hilltop and Gray Goose Districts themselves. We believe it's long overdue that the committee and the Congress as a whole took a close look at the power repayment, the irrigation repayment and marketing problems related to the Pick-Sloan program.

[The prepared statement of Mr. Osann on S. 1131 follows:]

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STATEMENT OF EDWARD R. OSANN
DIRECTOR, WATER RESOURCES PROGRAM
NATIONAL WILDLIFE FEDERATION
ON S.1131
HILLTOP AND GRAY GOOSE UNITS, SD
SUBCOMMITTEE ON WATER & POWER RESOURCES
COMMITTEE ON ENERGY & NATURAL RESOURCES

UNITED STATES SENATE

JULY 16, 1985

My name is Edward Osann. I am the Director of the National Wildlife Federation's Water Resources Program. The Federation is America's largest conservation organization with over 4.5 million members and supporters nationwide, and 52 affiliated state and territorial organizations.

The National Wildlife Federation opposes the integration of the Hilltop and Gray Goose Irrigation Districts in South Dakota into the Pick-Sloan Missouri Basin Program as proposed in S.1131. This bill would make Pick-Sloan electric power available to the two Districts at a nearly-free price of one-quarter of a cent per kWh.

Such integration would result in taxpayers throughout the nation subsidizing over 90% of the costs of pumping power provided to the Districts. Such a shift of power costs from the projects' beneficiaries to taxpayers will lead to increased consumption of electricity and distortions in the allocation of resources.

Until either the Congress or the Administration acts to remedy the confused financial condition of the Pick-Sloan Missouri Basin Program, we urge that no new repayment obligations be added to the Pick-Sloan Program. The Department of the Interior's own Office of Audit Investigations and the accounting firm of Price-Waterhouse both concluded that the Pick-Sloan power is not being sold consistent with sound business principles and repayment could extend through the year 2152. The Interior audit concluded that "the financial posture of Pick-Sloan is, at best, based on an uncertainty. At worst, it is based on an unreality. The net effect is that no one knows, within reasonable limits of accuracy, what rates to charge power users and M&I water users to repay Pick-Sloan costs."

Mr. Chairman, we believe that Congress should not compound this problem by stretching the meager Pick-Sloan power repayment even further into the future with the addition of two more irrigation units at this time.

Thank you for this opportunity to present these views.

Mr. **Brown**. Thank you, Mr. Osann.

Are you familiar with the rate increases that have taken place over the past few years under the Western Area Power Administration?

Mr. **Osann**. Yes, the current rate for power——

Mr. **Brown**. Have there been some increases?

Mr. **Osann**. There have been some increases in an absolute sense, yes.

Mr. **Brown**. I grew up in the Pacific Northwest, in Seattle where at that time the residential rate from the city of Seattle, not from the Bonneville Power Administration, the city of Seattle had their own hydroelectric facilities, and was about 6 or 6½ mills for residential power use.

That rate has gone up, of course, as the city of Seattle, if I remember correctly, purchased a portion of some of the thermal capacity at the Centralia plant and so on. But basically they were hydroelectric based facilities, and except for moderate increases in operation and maintenance, hydroelectric power costs remain virtually the same.

Mr. **Osann**. The current, the most recent rate increase for the Pick-Sloan program resulted in a composite rate of about 7 and a fraction mills per kilowatt hour, and that's based upon the ultimate development concept as a basis for ratemaking.

Mr. **Brown**. Were they integrating some thermal power costs then into the program to realize their rate increase?

Mr. **Osann**. No.

Mr. **Brown**. No, they were not.

Senator **Murkowski**. Mr. Hall?

STATEMENT OF STEPHEN K. HALL, EXECUTIVE DIRECTOR, LAND PRESERVATION ASSOCIATION

Mr. **Hall**. Thank you, Mr. Chairman.

For the record, my name is Stephen Hall. I have submitted written testimony. It's lengthy, and I will summarize, but I would request that the testimony be submitted in the record.

Senator **Murkowski**. It will be entered in the record as if read. We appreciate your efforts to be brief.

Mr. **Hall**. The Land Preservation Association is representative of the water agencies that serve roughly 1 million acres of agricultural and wetlands on the western side of the San Joaquin Valley. The area they serve is highly productive, but it does have serious drainage problems. It's estimated that up to 500,000 acres, roughly one half of the area, may ultimately need drainage.

The presence of shallow, salty groundwater is common in many parts of the world, and the problem is not really in removing the drain water but in finding a proper way to dispose of it. Back when the portion of the Central Valley project that serves the area that's impacted was built, that is, the Delta-Mendota and San Luis units, drainage was considered a central part of the project, and the Federal Government committed to build facilities to dispose of the drain water. A drain was envisioned which would carry the salt-laden water to the ocean, and for over 30 years that drain and other disposal methods have been studied.

A portion of the drain has been built, and Kesterson Reservoir, which was designed as a regulating reservoir, has now been put into operation but is an evaporation basin instead. And thus, many of the problems that are commonly known developed. Much of the problem is due to the fact that the project as envisioned has never been completed.

There has always been a concern about whether the drain could be operated in a way that was environmentally safe, and the recent discovery of selenium has complicated that issue, further raising a question as to whether a drain will ever be built or at least be built in the near term.

The Department of Interior has submitted the proposal in S. 1157 under which a series of studies would be undertaken principally to determine the nature and character of the water. The people I represent have no real problem with the studies, but there is a question in our minds as to what those studies will do towards achieving a solution. They are very broad based and in many cases include basic research.

The area that is affected is an important part of the regional and State economy. Our written testimony gives some dollar numbers as to what we produce annually to the States economy, and given the recent discoveries of selenium in areas to the south of the area that we represent, it's likely that the area will be even bigger than the 1 million acres that are now included in the Land Preservation Association.

In response to the recent discoveries and prior to those discoveries, the State has become involved. Recently Governor Deukmejian approved a budget which contained $5 million roughly for drainage-related studies. That's in addition to roughly $20 million that has already been spent on a pilot desalter. And from our standpoint, we've been encouraging the State to become even more involved because we believe it is a problem that the State needs to become associated with and involved in.

In addition to that and I believe this is significant in terms of the repayment of studies—one area in the Land Preservation Association representation area, Westlands Water District, is now in the process of building an interim pond to store and evaporate drain water which prior to this point has been going into Kesterson Reservoir. It's estimated that the cost of that project will be over $30 million.

To the north or that, in the grasslands area, which Assistant Secretary Broadbent referred to, the local people have formed a task force, and with both local and State funding have generated $2.5 million to address the problems in that area.

I think all of this indicates that we are eager to move forward in concert with the Federal Government, but we have two primary concerns about the proposal that has been made by the administration. One is that the studies do not focus enough on the solutions. We believe that they should prioritize such disposal techniques as desalting and deep well injection in particular.

Second, in terms of allocating the costs of the studies, if a broad range of studies is conducted, much of it being basic research, we believe that there will be applications elsewhere, and we do not believe that the full cost of those studies should be borne by the project users.

We stand ready to cooperate. I think that's evidenced by the fact that we either have or will be spending at the State and local level $55 million over the coming months. However, thus far we have had virtually no input to the Federal study process. In order for us to work with the Federal Government, we need to be included when decisions are made as to what will be studied and how.

In short, we simply cannot wait until the 1990's for a solution to be implemented, and we would ask the committee to direct the Department of Interior to prioritize those features of the studies which will lead to a solution. We have mentioned two specifically, desalting and deep well injection. There are others, certainly, but our major concern at this point is to step back from the broad array of studies that have been presented and prioritize those studies which we know to be among the more viable.

Thank you.

[The prepared statement of Mr. Hall follows:]

STATEMENT OF LAND PRESERVATION ASSOCIATION
BEFORE THE UNITED STATES SENATE
SUBCOMMITTEE ON WATER AND POWER

Land Preservation Association is an association of water agencies which collectively serve over one million acres of agricultural and wetlands on the west side of the San Joaquin Valley in Central California. These districts are in the San Luis and Delta-Mendota units of the U.S. Bureau of Reclamation's Central Valley Project. The area these agencies serve is one of the world's richest agricultural areas, but its future is in jeopardy because of inadequate facilities and methods to properly manage saline subsurface agricultural drainage water. On the west side of the San Joaquin Valley, more than one-half million acres of fertile, highly productive farmland, including portions of five of the nation's top 10 agricultural counties, will be impacted unless an economically feasible and environmentally acceptable solution to these problems is developed and implemented.

If the problems are not resolved, much of this land eventually will be forced out of production with direct losses (1984 dollars) in gross agricultural income of $500 million and total

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Presented by Stephen K. Hall, Executive Director, Land Preservation Association, Washington, D.C., July 16, 1985.

economic losses of at least $1.5 billion to the State and nation. These losses would impact not only the farmers and their employees, but many related supply, service, transportation and marketing businesses throughout California and the nation, as well as tax revenues at the local, State and federal levels.

Drainage problems are not unique to the San Joaquin Valley; they have plagued irrigated agriculture throughout history and continue to present serious problems in many countries around the world. Ancient civilizations either did not have the technology to solve their drainage problems or they were not aware of the total impacts of draining the land. Today, the technology is available to drain the land and has been successfully implemented in several regions of California, as well as other agricultural areas in the western United States.

The Drainage Problem

Problems develop when more salt enters the irrigated soil than is removed. The problem, essentially, is one of salt management, but is compounded by conditions which produce a "perched" water table that concentrates salts in the crop root zone. The principal factors involved in the drainage problem on the west side of the San Joaquin Valley include poor soil drainage, natural salts in the soil, additional salts in irrigation water, insufficient water supply for adequate leaching of salts, and inadequate disposal sites for the saline drainage water.

Poor soil drainage -- Much of the land immediately west of the trough of the Valley is underlain by impermeable clay layers at depths of 10 to 40 feet. This natural barrier prevents deep percolation of water and dissolved salts, causing a perched saline water table above the clay layer. As the saline water builds up over a period of years, it encroaches into the crop root zone and gradually reduces production and farm income.

Natural salts -- Saline and sodic soils occur naturally in arid and semi-arid regions, and with irrigation, the salinity problem expands. The soils on the west side of the Valley contain significant amounts of natural salts and these salts continue to dissolve as water moves through the soil.

Salt in irrigation water -- Even though the irrigation water brought into the west side contains low concentrations of salt, the total salt imported amounts to more than 1,000,000 tons per year. Since plants extract almost no salt from the soil, the amount applied in the irrigation water is significant in the salinity problem. For example, the water imported through the Delta-Mendota and San Luis Canals contains only about 230 ppm-TDS, but application of three acre-feet of this water adds nearly a ton of salt to each acre of land.

In order to prevent excessive salt buildup in the soil, it is necessary to apply somewhat more water than the crop actually needs. The additional water "leaches" the soluble salts out of the root zone, thus maintaining a favorable salt balance in the soil. Farmers on the west side of the Valley, however, face two problems in regard to leaching. Insufficient water supplies to leach the salts and inadequate disposal sites for the resulting leachate. The average amount of Central Valley Project water available in some areas is less than 2.5 acre-feet per acre annually, somewhat less than many crops need. Even though farmers plant considerable acreages of low water use crops, the amount of water available often is insufficient for adequate leaching of salts. And, in the absence of drainage facilities, they are reluctant to apply any significant amount of leaching water, since that practice aggravates the high water table.

Inadequate disposal sites -- The San Joaquin River has been the historical outlet for drainage effluent from lands in the northern San Luis and Delta-Mendota service areas, but this practice is contributing to degradation of the water in the River and the Grassland area. The only disposal site for drainage water from lands in the southern San Luis service area is Kesterson Reservoir.

Economic Effects of Inadequate Drainage

As a perched saline water table develops and rises into the crop root zone, the economic losses develop slowly but steadily. The first effects show up in deep-rooted, salt-sensitive crops which gradually produce less and less, and eventually die. Salt sensitive crops with shallow roots are the next to be affected, and yields of these crops can be severely reduced. Farmers then must switch to salt-tolerant crops which usually produce lower income. Eventually, even the most salt-tolerant crops such as barley cannot be profitably grown. Shallow-rooted grasses may survive for a while, but finally, the soil surface crusts over with salt and nothing will grow.

Research in Westlands Water District during the 1979, 1980, and 1981 crop years indicated that merely switching to salt-tolerant crops--without considering yield reductions -- reduced gross income from 23 to 30 percent when the saline water table was within 5 feet of the soil surface. Income was reduced by 10 percent with perched water between 5 and 10 feet. In Broadview Water District, where drain water was reused as a part of the irrigation water supply, farmers were forced to switch to lower value crops within five years.

Researchers with USDA's Soil Conservation Service have found that many growers have a production loss of 20 percent without being aware of significant drainage or salinity problems.

If satisfactory solutions to the drainage problem are not developed and implemented, all of the production from about 500,000 acres on the west side eventually could be lost. Based on 1983 values, this would amount to $500 million in direct losses, economic losses of $1.15 billion regionally and $1.5 billion statewide.

History

Drainage problems on the west side of the Valley began more than a century ago, when water was first diverted from the San Joaquin River. Extensive irrigated areas actually went out of production because of salt accumulations before deep drainage ditches were constructed to carry away the perched saline water and allow leaching of the salts. Later, streams and sloughs flowing into the San Joaquin River from the west were dredged to provide natural drains to remedy the area's perched water table problem.

Plans to manage the perched saline groundwater in the drainage problem area have been developing over the past 30 years. The 1960 Congressional authorization of the San Luis Unit specified that "Construction of the San Luis Unit shall not be commenced until the Secretary (of the Interior) has made provision for constructing the San Luis interceptor drain." This federal act required adequate drainage to be provided in one of two ways: the State would build a master drain to serve the entire Valley;

or the federal government would provide an interceptor drain for the San Luis Unit. In the mid-1960's, a joint federal and State effort examined construction of a master drainage canal to carry drainage effluent from Bakersfield into the western part of the Sacramento-San Joaquin Delta. However, after the State failed to obtain guarantees for repayment from the water users in the State service area, the State declined to participate in building a master drain.

Because the Congressional authorization of the San Luis Unit and the contracts with the Unit contractors stated that the Interior Department was responsible for providing drainage service, the federal government proceeded alone with construction plans. On January 9, 1962, the Secretary of Interior advised Congress that the Bureau of Reclamation would construct the San Luis Drain, clearing the way for Project construction to begin. Ground-breaking ceremonies for the San Luis Unit were held on August 18, 1962.

The drainage plan at the time was to build an unlined open ditch from Kettleman City to Antioch in the western Delta, near San Francisco Bay. It soon became obvious to those concerned about protecting the land along the drain that it would be necessary to line it in order to prevent seepage problems. A study of eighteen alternatives by the Interagency Drainage Program, a joint effort of the U.S. Bureau of Reclamation, California

Department of Water Resources and the State Water Resources Control Board, concluded that the Delta discharge was the best alternative, but recommended the discharge point be moved to the vicinity of Chipps Island and that a regulating reservoir be added to control discharges during peak periods of drainage flows.

Existing Drainage Facilities

As noted earlier, much of the west side of the San Joaquin Valley north of Westlands has historically drained into a low lying area adjacent to the San Joaquin River known as the grasslands. It now appears that the trace elements in that drain water may be adversely impacting the grasslands area.

In 1968, the Bureau of Reclamation started to construct the San Luis Drain and the Kesterson Regulating Reservoir. However, construction of the Drain stopped in 1975 because of concerns about the effect of the drainage discharge in the Delta-Bay estuary and funding limitations. Strong opposition from San Francisco Bay area civic leaders and environmental groups, who fear damage to bay water quality, have stalled efforts to find an acceptable Delta-Bay estuary disposal site. As a result, only 82 miles of the planned 200 miles of the Drain and only 1,200 acres of the planned 4,600 acres of the Kesterson Regulating Reservoir were completed.

About the time the San Luis Drain and Kesterson Reservoir were being constructed, the existing portion of the Westlands Water District drainage collector system also was constructed.

Prior to the construction of Kesterson as a regulating reservoir for drainage effluent, there was no wildlife refuge there. Creation of the Kesterson National Wildlife Refuge in the reservoir area was agreed upon between the Bureau of Reclamation and the U.S. Wildlife Service as a means of enhancing wetland conditions for waterfowl.

By 1977, the Bureau of Reclamation determined that additional environmental studies would have to be completed before either Kesterson Reservoir could be enlarged or the Drain could be completed. It was also clear that until additional drainage disposal facilities were available, there would have to be a limit on the amount of drainage effluent discharged. Therefore, in May 1981, the Bureau of Reclamation informed landowners that it was placing a moratorium on the connection of any additional on-farm drains to the drainage collector system.

The Selenium Problem

The element selenium is one of the major obstacles to be overcome in the development of plans to dispose of the saline agricultural drainage water. The first indications of a potential problem with toxic amounts of selenium came in 1981, when the Bureau of

Reclamation discovered relatively high concentrations of this element in drain water flowing into Kesterson Reservoir. The Bureau reported this finding to the U.S. Fish and Wildlife Service, which initiated its own sampling and testing program for drain water and fish in 1982. The following year, the agency surveyed the nesting waterfowl in the area and found a high incidence of dead and deformed embryos in the nesting species (mainly coots, grebes, and stilts) presumably caused by selenium.

The grasslands is the recipient of drain water from approximately 77,000 acres of drained land in the northern San Luis and Delta-Mendota service areas. That drain water has been an important part of the grasslands water supply; however some of the drain water from the southern end of this area has selenium in it. While there are no known cases of dead or deformed embryos or birds in the grasslands, the selenium levels are sufficiently high to be of concern. Extensive studies are underway to determine the extent of the problem.

Kesterson Cleanup

As a result of the problems with waterfowl at Kesterson Reservoir, Interior Secretary Hodel announced on March 15, 1985, that Kesterson Reservoir would be closed and irrigation water to the 42,000 acre area draining into Kesterson would be shut-off. Subsequently the Westlands Water District negotiated an agreement with the Department whereby the irrigation water would not be shut-off, Kesterson would be phased out of operation rather than being closed immediately and the Westlands Water District would develop a local program to dispose of its drain water.

Local Efforts

Since that time Westlands has developed a program which will allow them to construct evaporation ponds at a suitable site within the District, with full environmental and financial documentation. Siting and operations criteria will be used to eliminate the problems experienced at Kesterson Reservoir.

Based on current estimates, the cost to the District landowners for this project could exceed $30 million.

In the northern area, the Grassland Water Task Force has been formed to address the problems in the grasslands and thus prevent the threats to wildlife that have occurred at Kesterson Reservoir. State and local funding has been obtained for this project, which is expected to cost in excess of $2.5 million.

These actions represent substantial local effort to address the problem in a responsible manner. The ponds proposed in the southern area are expected to satisfactorily dispose of the water from the presently drained land for years to come. The efforts in the northern area, while not as comprehensive, will allow drainage to continue for at least the next 3 to 5 years.

Neither of these programs, however, is seen as the best ultimate solution for drain water disposal. The drainage problem is big and getting bigger. Presently, there are 85,000 acres drained with on-farm drains in the districts represented by LPA. More land needs drainage now, and eventually up to 500,000 acres will need drainage. Those 500,000 drained acres could generate up to 300,000 acre-feet of drain water annually. A comprehensive, long range disposal program must be developed and implemented to accommodate the increasing drainage needs.

Department Of Interior Studies

Past drainage studies have indicated that the preferred disposal method would be to discharge the agricultural drainage effluent to the San Francisco Bay estuary. This disposal option has the advantage of exporting to the ocean the tremendous salt load that is in the drain water. While that option is still considered technically feasible, the social and institutional problems associated with it would likely delay completion of such a project for many years. Simply put, a solution to this problem cannot wait until the many concerns about this option can be adequately addressed.

If farmers in the western San Joaquin Valley are to continue farming this highly productive land without the threat of lost productivity from poor drainage or sudden disruption of irrigation water, a disposal plan must be developed soon.

Department of Interior agencies have now proposed a series of studies designed to provide information about virtually every aspect of the drainage problem. While we have not had an opportunity to review their proposal in detail, we understand the studies include such things as the impact of selenium and other trace elements on various species of fish and other aquatic animals, as well as studies to further measure toxic levels of these same elements in ducks and other waterfowl. These studies will provide useful information, but much of this work will take years to complete and may not provide the specific information necessary to make the difficult public policy decisions that will be necessary in order to develop a comprehensive disposal strategy.

The Department of Interior's proposal requests approximately $12.5 million in the current fiscal year as part of a multi-year study package totalling over $40 million. The measure includes provisions for repayment of study expenses by the water users. As noted earlier, the studies proposed are wide ranging, and in some cases include basic research. The array of studies proposed by the Department of Interior goes far beyond what is needed to focus on the central problem of developing an agricultural drain water disposal plan.

The Land Preservation Association, as the representative of the area most directly impacted by this problem, believes that the costs of studies which lead directly to a long-term drainage disposal project should be borne, at least in part, by the project beneficiaries. Studies which are not directly applicable to the project, however, should be nonreimbursable. Further, given the complexity of the problem and the urgent need for solutions, it is imperative that priority be given to studies which lead toward early development of a solution to the drain water problem.

Several disposal techniques other than discharge to the San Francisco Bay now appear viable but need further study. Chief among these is desalinization. Desalting the drain water, while removing selenium and other trace elements, has the additional advantage of providing additional fresh water supplies in a water-deficient area. With some refinement, present-day technologies appear capable of desalting the water at costs which are comparable to other disposal plans when revenue from the sale of the fresh product water is used to offset a portion of the costs.

The State of California has already invested close to $20 million in a pilot desalter near the problem area. The information gained from that pilot plant can be the foundation for an accelerated research program at both the state and federal levels.

Other drain water management techniques which warrant immediate investigation include injection of the drain water into very deep unusable aquifers, where water quality is not a concern. Specifically, studies are needed to determine whether drainage water, which typically contains high concentrations of sulfates and calcium, can be economically injected. Additional efforts can and should also be made to reduce the volume of drainage effluent, thereby reducing the cost of disposal.

These disposal options have a great deal of promise and should be investigated in an aggressive manner. Federal studies should focus on such alternatives so that they can be thoroughly tested, and if feasible, implemented in a timely way.

Local interests would strongly support such efforts and would be willing to participate in the study process, financially and otherwise. State and local investment in drainage solutions already totals nearly $20 million, and over the coming months that figure will grow to more than $55 million.

LPA is committed to solving this complex problem in a timely way and we urge the federal government to embark on an investigation that will help accomplish that goal.

Thank you for this opportunity to testify.

STMT 7/85

Senator Murkowski. That takes care of your testimony?

Mr. Hall. Yes.

Senator Murkowski. Thank you, Mr. Hall.

Mr. Lloyd, I notice in your testimony you used the reference that the dilemma you are in was rather absurd when you're caught between two Federal agencies. With regard to the Farmers Home Administration and the Bureau of Reclamation, have you had any reason to think they are sympathetic to the position that you're in or simply very much opposed to each other?

Is there a high degree of competitiveness between them, or do they work together cooperatively? Why doesn't one acquiesce to the other?

Mr. Lloyd. If you're asking me, Mr. Chairman——

Senator Murkowski. Yes.

Mr. Lloyd [continuing]. I really don't know why. I can't answer that question. We have sat down with the Bureau.

Senator Murkowski. Well, I will direct that question to, I guess, the representatives of both agencies. It would be appropriate if you'd like to suggest a draft question and submit it to Mr. Brown, and we'll take a look at it and send it down. Because I would agree with you; you've got two Federal agencies, and they're both under a dictate from Congress to be responsive in their areas of responsibility. But, you know, if they're working like two crabs going down the beach sideways, why, you know, that isn't in the public interest.

Mr. Lloyd. I think that we would certainly welcome the Bureau of Reclamation. If they want to conduct studies on these projects and what the impact of low-cost power would do for them, I can't see that we would have any objection to that whatsoever.

Senator Murkowski. You heard the testimony of Mr. Broadbent with regard to the point that he would be willing to accept a private study on those two particular proposals.

Mr. Lloyd. And I assure you, Mr. Chairman, we've got private studies, you know.

Senator Murkowski. Why don't you deliver them down there and say here, now, make a decision; you've got a study?

Mr. Lloyd. Well, we can very well do that.

Senator Murkowski. We can forward them on your behalf if you want. It just seems to me that our job is to try and expedite, and if we can, you know, if we're down to a situation where we've got two competitive agencies and they're unresponsive, why, submit something for us, and we'll send it down. And if you've got private studies that are up to date and qualify, we'll send them over to them and ask them to make a decision.

What's the downside to that from their point of view?

Mr. Lloyd. I don't think there is any downside.

Senator Murkowski. Well, let's try.

Mr. Tviet. I guess my comment in terms of studies is that I've been fairly involved with the Bureau of Reclamation in various ways during the time I've been involved with irrigation, and they seem to like to do a lot of studies but produce no results.

Senator Murkowski. You don't have to preach to the choir.

Mr. Tviet. But we still have no way to qualify whether or not sprinkler irrigation on these soils is harmful.

Senator MURKOWSKI. Why don't we get the studies, send them down to the Bureau and ask them to make a decision whether they agree with the study, and it's adequate and sufficient and provides them with enough information to make a decision and see if we can get on with this thing. All right?

Mr. LLOYD. We'd certainly agree with that.

Senator MURKOWSKI. I have no further questions for this panel. I excuse you and wish you a good day. Thank you for coming out.

Panel two, Mr. Tom Donnelly, executive director, National Water Resources Association. He'll be accompanied by Mr. Doyle Boen, chairman, small projects, National Water Resources Association. John Younquist, water resources engineer, Douglas County, Roseberg, OR; John Fletcher, secretary, Upper Yampa Water Conservancy District, Steamboat Springs, CO. Edward R. Osann is back again, director of Water Resources Program. And Dr. David Allee, professor of resource economics at Cornell University. We've got a few easterners and a few westerners.

Please proceed. And I would appreciate you expediting your testimony, because I'm not going to hold the hearing much longer.

STATEMENT OF TOM DONNELLY, EXECUTIVE DIRECTOR, NATIONAL WATER RESOURCES ASSOCIATION

Mr. DONNELLY. Mr. Chairman, thank you.

For the record my name is Tom Donnelly. I'm executive director of the National Water Resources Association. I'm accompanied today by Doyle Boen, who is the chairman of our small projects committee, Mr. John Younquist, and Mr. John Fetcher.

I'd ask unanimous consent that our——

Senator MURKOWSKI. Without objection——

Mr. DONNELLY [continuing]. Statements be entered in the record. We're anxious to work with the committee, and we're very pleased that the committee is scheduling this hearing today.

I'd like to defer to Mr. Doyle Boen to present briefly the association's statement.

Senator MURKOWSKI. Thank you, Mr. Donnelly.

Mr. Boen, chairman, Small Projects Committee, National Water Resources Association.

STATEMENT OF DOYLE F. BOEN, CHAIRMAN, SMALL PROJECTS COMMITTEE, NATIONAL WATER RESOURCES ASSOCIATION

Mr. BOEN. Thank you, Mr. Chairman.

I sincerely appreciate your committee calling hearings on this bill, S. 1171, at the early date that you have. And I know I express the appreciation of our Small Projects Committee and the National Water Resources Association. I will only skip through a little of my statement, and in the interest of time at the outset I'd like to ask permission to submit a statement that was presented to me by a member of our Small Projects Committee.

Senator MURKOWSKI. Without objection.

Mr. BOEN. This will be the statement on behalf of the Santa Ana Watershed Project Authority submitted by J. Andrew Schlange.

[The material referred to follows:]

3600 Tyler Street, Suite 207, Riverside, Calif. 92503 (714) 785-5411

SANTA ANA WATERSHED
PROJECT AUTHORITY

COMMISSION FOR THE PROJECT AUTHORITY

CHINO BASIN MUNICIPAL WATER DISTRICT
EASTERN MUNICIPAL WATER DISTRICT
ORANGE COUNTY WATER DISTRICT
SAN BERNARDINO VALLEY MUNICIPAL WATER DISTRICT
WESTERN MUNICIPAL WATER DISTRICT

MANAGER
J. ANDREW SCHLANGE

July 10, 1985

Senator Frank H. Murkowski
Chairman of the Sub-Committee on Water and Power
Committee on Energy and Natural Resources
Hart Senate Office Building, Room 212
Washington D.C. 20510

Dear Mr. Chairman:

The Santa Ana Watershed Project Authority (SAWPA) supports S 1171 and HR 2025 (Companion Bills) which increases the authorization to be appropriated under the Small Reclamation Projects Act of 1956.

SAWPA covers a substantial portion of the Santa Ana River Basin which includes major sections of the Counties of Riverside, San Bernardino and Orange in California. The economy of our inland valleys are largely agricultural and are dependent primarily upon depleting groundwater basins. These areas are in desperate need of multi-purpose water projects that involve conservation and water importation. The Small Reclamation Projects Act offers the only means that we have found to develop these projects to sustain the existing economy and preserve our groundwater basins.

SAWPA has secured approval for a loan under this Act for one project to solve the problems in one such area and is now preparing an application for a loan to develop a second project in another county with serious groundwater problems. This proposed project and others under consideration by SAWPA are for areas rural in nature with limited financial resources. These areas do not have the financing capability to construct the necessary multi-purpose facilities to protect and enhance their water supplies and fulfill their purposes without benefit of this type of program.

Such loan applications take approximately (3) three years to complete and cost from $200,000 to $300,000 funded by the applicant before the application can be filed for a loan. Unless the funding ceiling is raised, as proposed by the pending legislation by Congress, to assure local agencies that funds will be available when loan applications are approved, agencies such as SAWPA cannot risk the expenditure for these up-front costs.

Without assurance that this very beneficial program is to be extended, agencies serving communities such as those outlined may have to curtail their long-range planning and program commitments which are essential to the orderly development of these communities.

Of the many federally financed loan programs, the USBR Small Loan Program has produced benefits far in excess of any other, and is the best in government from a strong cost-sharing standpoint. All loan funds advanced by the USBR require full repayment. Except for irrigation benefits, interest is paid on all loan funds by the applicant (who also provides 15-25% front-end cost-sharing). To my knowledge, there has not been a single default in repayment during the 29 years of operation. -- The current $600 million funding ceiling which is now fully committed represents the total of all authorizations for appropriation under the program since its inception in 1956. -- All repayment funds return directly to the U.S. Treasury.

SAWPA views the Small Reclamation Projects Act as a good investment in the nations future in the terms of increased water supply, utilization and stabilization for ever increasing multi-purpose needs and for sustaining existing agricultural economics.

Raising the funding ceiling will provide the vehicle for the continued orderly developmnt of necessary water projects and give local agencies such as SAWPA the incentive to commit their time and local financial resources.

Unfortunately, I will not be able to attend your hearing regarding this matter and have therefore asked Mr. Doyle Boen to represent me and present our comments. We at SAWPA strongly urge that your committee give favorable consideration to S 1171 and request that this statement be made a part of the record of this committee hearing, scheduled for Tuesday, July 16, 1985.

Very truly yours,

SANTA ANA WATERSHED PROJECT AUTHORITY

J. Andrew Schlange
General Manager

Mr. **Boen**. Mr. Chairman, the Small Projects Committee and NWRA has appreciated the support it's had from this committee since the legislative beginning of the program, and we feel that it's one of the more important programs for financing water resources projects that has come about.

Many of us back in the early years were looking for an opportunity to upgrade the quality of our local water projects where irrigation was a major consideration and where we had—in rural areas where we had water problems involving ground water depletion, water quality depletion of our total resources to the point where if we continued to pump, we would destroy the ground water basins, and we would lose everything.

As a result of the enactment of Public Law 984, the Small Reclamation Projects Act, just many agencies have been able to construct projects that have incorporated long-term planning to provide for the multipurpose use to provide water for small communities, at the same time providing water for irrigation to stabilize the ground water basins and to improve our water quality, and to conserve water.

Now, without this program, the local agencies were forced to do so-called poor boy jobs that often were obsolete long before they were repaid. The Department of the Interior representatives, Assistant Secretary Broadbent and his panel, have gone into the details of the program, pointing out the cost sharing, cost developing projects.

I'd like to point out that to date 114 projects under the act have been completed or under construction. Fifty additional projects are approved or in various stages of report development and review preparatory to approval.

Now, the significant thing of this is of these projects that are in the more preliminary stage, 41 projects representing $400 million in loans, as stated, could not be funded unless S. 1171 or similar legislation is passed.

Now, this summary does not include the many projects throughout the reclamation States that are being locally considered but have not as yet filed their notice of intent. And it has been already pointed out that the costs of these projects run up in the $200,000 to $300,000, and unless the program is extended to provide assurance that ultimate funding could be available, local agencies could not afford to continue the expense of this important planning effort.

I'd also like to point out a couple of the major features that I think are important. The programs have been more recently used to bring about, along with irrigation and taking care of the M&I problems, to bring about basin management by stabilizing the overdraft and by providing better quality water.

Now, I think I don't want to duplicate what others have said and what's in my statement, but with regard to possible amendments to S. 1171, we of the committee, Small Projects Committee reluctantly support the proposal in H.R. 2025, 2-0-2-5, to change the interest rate to reflect the actual current cost.

Now, not specifically because of the cost of the rate of the interest but of the approach to it, we want to point out that there is merit to the present formula in that it avoids radical change during the project planning and implementation period.

Now, historically the interest rate—well, I would say the average interest rate formula was established during the 1960's, and the reason it was established at that time was the problems developed by instability of an interest rate. The projects' investigations were carried through, and about the time a contract was negotiated, the interest rate would change, is it would under using, applying a current interest rate or any changing interest rate approach.

Now, we feel there is merit to stabilizing the interest rate for a period of time, and we would be hopeful that some method, that some method could be found in administering a change in the rate to average it, at least for short periods or at least to stabilize it, so that following a contract, say, validation based on a tremendous amount of study, that in the home stretch the interest rate didn't get changed and create problems with the local people in getting their approval.

We reluctantly support another amendment in that same bill to establish a minimum local cost sharing percentage for the reason we feel that the Department of Interior, in response to criteria established by the Office of Management and Budget, is accomplishing the same objective while providing workable flexibility that is more favorable to both the applicant and the Federal Government.

This criterion has been adjusted from time to time to meet changing fiscal conditions, and we would hope that the cost sharing situation would be such that it would provide some flexibility to accomplish the same purpose: For example, a shorter repayment period and a longer—a larger cost sharing and a shorter repayment, or a smaller—I'm turning it around—a longer repayment period could be accommodated if the cost sharing was larger at the outset, and vice versa. This way we would have the flexibility to accomplish the same objectives.

We would also oppose any additional amendments that would seriously affect the proven success of the program.

Now, Mr. Chairman, in closing I would once again thank your committee for its strong support and hope that your committee will be in a position to favorably consider S. 1171 and support its enactment as soon as possible this session of Congress so this large number of projects that are spending considerable money for planning can proceed with confidence. And that large amount of money is very difficult to raise in many of these areas, and it would be a very serious blow if the program had a deferment.

I'd be happy to attempt to answer any questions, Mr. Brown, that you have.

[The prepared statement of Mr. Boen follows:]

STATEMENT BY DOYLE F. BOEN, CHAIRMAN OF THE SMALL PROJECTS COMMITTEE OF THE NATIONAL WATER RESOURCES ASSOCIATION AT THE HEARING ON S. 1171, JULY 16, 1985, A BILL TO AMEND THE SMALL RECLAMATION PROJECTS ACT BEFORE THE SUBCOMMITTEE ON WATER AND POWER COMMITTEE ON ENERGY AND NATURAL RESOURCES UNITED STATES SENATE

Senator Frank H. Murkowski, Chairman
Subcommittee on Water and Power
Committee on Energy and Natural Resources
U. S. Senate
Washington, D. C. 20510

Dear Mr. Chairman:

My name is Doyle F. Boen of Hemet, California. I appreciate the opportunity to appear before your Committee in the capacity of Chairman of the Small Projects Committee of the National Water Resources Association.

The Association and its Small Projects Committee thank you for scheduling this hearing on S. 1171 to amend the Small Reclamation Act to extend the present ceiling of the authorization to be appropriated to carry out the provisions of the Act. Also we wish to thank your Committee for its strong continued support of this Act since its early legislative history beginning in 1953.

The National Water Resources Association was given the opportunity to work closely with this Committee during the years 1953 through 1956 in the development of features of the Small Reclamation Project Act and has continued to work with the Committee to improve and extend the program by the passage of six additional bills since that time. The Association has reaffirmed its support for this program by formal detailed Resolutions annually since its original enactment and specifically supports S. 1171 and its companion House Bill, H.R. 2025.

Since the Small Reclamation Project Act was passed in 1956, 114 projects under this Act have either been completed or are under construction and 50 additional projects are approved or are in various stages of report development and review preparatory to approval, of these 41 projects representing about $400 million in loans could not be funded unless S. 1171 or similar legislation is passed. This Summary does not include the many projects throughout the Reclamation States that are being locally considered but have not as yet filed formal "Notice of Intent."

It should be noted that these applications for loans include extensive planning, engineering feasibility and environmental reports and other findings that normally require two to three years or more to complete and cost the applicant from one to more than three hundred thousand dollars. Unless the Program is extended and an assurance that ultimate funding could be available, local agencies could not afford to continue the expense of this planning effort.

I wish to note that from my personal experience and that of many others in the water resources field, there is no other Federal assistance program available to assist local non-Federal multipurpose water projects in less affluent areas of the West involving irrigated agriculture.

We believe that some of the principal reasons that the program has enjoyed the support of the Congress are as follows:

- Repayment of loan is 100 percent with interest on benefits to M&I use, excess lands, and power generation. In 29 years experience, there have been no defaults.

- Essentially, projects under this program are multipurpose, involving: (1) Rehabilitation of old systems resulting in conservation of water and energy; and (2) Storage, transmission and distribution facilities to receive, store, regulate and distribute local water, flood water and surplus imported water that would otherwise be wasted. These projects in turn make possible the conservation and management of all available water resources to meet increasing water demands, eliminate or reduce groundwater overdraft and improve water quality.

- The applicant (local water agencies), with assistance by the private sector, does the planning, design, and construction contract administration. The Bureau of Reclamation is responsible for general review of design and final engineering plans and inspects the quality control of construction to protect the investment of the Federal Government.
- The scope and quality of water resource development and rehabilitation projects completed under this program meets the National Water Resources objectives and is a tribute to the advantages of local planning and construction administration coupled as a team with Bureau of Reclamation "Know How", Expertise and Overview.
- With regard to possible amendments to S. 1171: (1) We reluctantly support the proposal in H.R. 2025 to change the interest rate formula to reflect the actual current cost. There is merit for the present formula in that it avoids radical change during the project planning and implementation period; and (2) We reluctantly support the proposal to establish a minimum local cost sharing percentage for the reason that the Department of Interior in response to criteria established by the Office of Management and Budget is accomplishing the same objective while providing workable flexibility that is more favorable to both the applicant and the Federal Government. This criteria has been adjusted from time to time to meet changing fiscal conditions. We oppose any additional amendments that would seriously affect the proven success of the program.

In closing, on behalf of the National Water Resources Association and its Small Projects Comittee, I wish to thank you for the strong support that your

Committee has given for the Small Reclamation Projects Act and other water resources development programs which are so important to our Nation and of vital concern to the National Water Resources Association. And finally, we urge that your Committee favorably consider S. 1171 and support its enactment this Session of Congress so that the planning and project development of a great number of important water projects can be continued with confidence.

Respectfully,

Doyle F. Boen
Chairman of the Small Project Committee
National Water Resources Association

Mr. **Brown.** Thank you very much, Mr. Boen. I think that we will reserve questions on this legislation until we complete the presentation by the panel. I can assure you there will be some questions.

Mr. Younquist.

STATEMENT OF JOHN YOUNQUIST, WATER RESOURCES DIRECTOR, DOUGLAS COUNTY, OR

Mr. **Younquist.** Mr. Brown, I'm John Younquist. I'm water resources director for Douglas County, OR. And real briefly, Douglas County and the boundaries of the Impaw Basin in Oregon, some 4,500 square miles, are synonymous. When we talk about the Impaw Basin, we are talking about Douglas County.

We are strongly in favor of Senate bill 1171. We just completed or are in the process of completing a project, and we hope to do another. The project we're just completing is a $35.1 million project, and it's probably the first project in reclamation's history under this program that encompasses all the beneficial uses acknowledged in the program. So we have a combination of loans and grants within this.

Douglas County has put up front $9.1 million. We'll be repaying a little over $11½ million in loans, and over half of that is at 10⅜ percent interest. I would point out that I don't think that interest schedule they're using today is that bad, because that is quite comparable to municipal bond rates in the State of Oregon anyway.

I think the Small Reclamation Projects Act offers some of the best investment opportunities for the Federal Government. Local benefits, you've probably heard many times, are quite common. Some of the Federal benefits that are not quite so obvious, as was earlier mentioned, is the local sponsor, like Douglas County, pays all of the up-front costs—virtually no Federal payroll, no cost whatsoever in getting to the EIS or whatever is necessary.

I notice they're talking about $200,000 to get a project before the Bureau. Our next project estimate was it would be $2 million to get it before the Bureau of Reclamation. And Galesville took me $6 million before my application was approved by the Bureau of Reclamation. So a commitment like ours is something we watch very closely as to the ceiling.

There are a lot of developments, locally done, that if a program like this was not made available to go out, and are built basically on a shoestring; the local sponsor's engineers responsible for this project, for its integrity and its safety. I think one of the advantages to the Small Reclamations Act is that the Bureau of Reclamation does not get actively involved in your project.

However, they check it, and believe me, they check it thoroughly, all through the stages of design and construction. And given the dam safety aspects we're looking at throughout the Nation, I think that is quite important.

Also, water conservation nationwide is being talked as a very important subject. I would point out that any project that has been constructed under the Small Reclamations Act has a water conservation program plan filed with the Bureau. It's renewed at regular intervals, and it is closely scrutinized, and water conservation is a part of the program.

As I said before, I'm going to paraphrase, this, and my testimony will be in your hands by Monday morning, because I found an error in it. I will send it out Friday when I get back to Roseburg.

I think this program is really a good investment for the Federal Government, because any of the other water resources programs the Federal Government has takes a tremendous cost to the Federal Government in staff, if nothing else.

We picked a site that was looked at by the Corps of Engineers in an earlier study, and the 1969 estimate of costs for the Galesville site was $42 million. Now, since 1969 to 1984 we have considerable inflation; yet we're building this by $35.1 million at the same height the Corps of Engineers had looked at. So I do think there are economies here that don't show right on the surface.

And like Mr. Brown, I'd be glad to answer any questions you might have.

Mr. **Brown**. Thank you very much, Mr. Younquist.

Mr. Fetcher.

STATEMENT OF JOHN R. FETCHER, DIRECTOR AND SECRETARY, UPPER YAMPA WATER CONSERVANCY DISTRICT

Mr. **Fetcher**. My name is John Fetcher. It doesn't happen to have an "L" in it, so that it is—the other day I was explaining my name over the phone, and I said it's Mr. Fletcher without the "L," and the response came back, "Oh, Mr. Letcher," so I have to be careful.

My son and I operate a cattle ranch north of Steamboat Springs in Colorado. It's a high mountain ranch where our principal product is hay for beef production. I'm also one of the founders of the Steamboat ski area, and I had to get into the ski business back in 1962 because the cattle were not paying the bills at that time. And although sometimes I realize that there is more money in the people business, sometimes I must say I prefer the cows, but we'll let that pass.

Our district is very active in promoting an important project on the Yampa River 16 miles south of Steamboat, and we're heavily dependent on funding from the Small Reclamation Projects Act. It's a multipurpose project, very similar to your project, John, and about the same size, but somewhat less costly. It will provide 4,000 acre feet of irrigation water for agriculture in that area, primarily again for beef production. It will provide 2,000 acre feet for the growing municipalities along the river and 9,000 acre feet of water for power production in that area. As you probably know, we sit on a vast coal reserve in northwest Colorado. And finally, as an important adjunct to our economy, it will have a permanent pool of 15,000 acre feet for recreation.

Over the last 3 years our district has spent $756,000 for basically what's a pile of paper. It consists of our loan application, our environmental impact statement, geotechnical investigations and engineering. That's a lot of money for what is really a pretty small district. So we're really dependent on this program to provide the balance of financing.

The State has made a commitment to the project of $6 million under what is known as the Colorado water conservation fund. This would be a 30-year loan at a low interest rate of 5 percent. The State of Colorado is committed to water projects, as you well know, and to help us use some of the entitlement that we're entitled to under the Colorado River compact. The total project, by the way, will cost about $16 million, of which the district and the State are putting up 49 percent, which is a pretty good ratio for cost sharing.

Finally, this reservoir which we have scheduled for construction next summer is simply an example of many other good projects which could be financed under this program.

That's the end of my testimony.

[The prepared statement of Mr. Fetcher follows:]

UPPER YAMPA WATER CONSERVANCY DISTRICT
BOX 5220 - STEAMBOAT VILLAGE, CO 80499

STATEMENT OF JOHN R. FETCHER, STEAMBOAT SPRINGS, COLORADO ON S. 1171.

Mr. Chairman and Members of the Committee:

My name is John R. Fetcher. My son, myself and our wives operate a cattle ranch 20 miles north of Steamboat Springs, Colorado. I am a director and secretary of the Upper Yampa Water Conservancy District, the applicant for funding under the Small Reclamation Projects Act program for the 34,000 acre foot Stagecoach Reservoir project, 17 miles south of Steamboat Springs on the Yampa River in Northwest Colorado. It is a multi-purpose project which will provide 4,000 af for agricultural irrigation for beef production, 9,000 af for power generation, 2,000 af for rapidly growing municipalities along the river and 15,000 af as a permanent pool for recreation and wildlife enhancement.

We understand from Bob Olson, Commissioner of Reclamation, that this project, like several others, cannot be funded under what is left of the original authorization. Over the last three years our District has spent $756,000 which includes costs such as the EIS, geotechnical investigation, engineering, and the FERC application for a small hydroelectric plant. The non-Federal funds, including a $6,000,000 loan from the Colorado Water Conservation Fund and $2,000,000 from our District's resources, will represent 49% of the total estimated project cost of $16,328,000.

This reservoir, scheduled for construction next summer, is one of many examples in the western states dependent on funding from the Small Reclamation program. As a member of the NWRA Small Projects committee, I strongly support, with acceptable amendments, a continuation of this source of funding.

Mr. **Brown**. Thank you very much, Mr. Fetcher.

Mr. Osann.

STATEMENT OF EDWARD R. OSANN, DIRECTOR, WATER RESOURCES PROGRAM, NATIONAL WILDLIFE FEDERATION

Mr. **Osann**. For the record let me indicate that the National Wildlife Federation is opposed to enactment of S. 1171 in its present form. We are sympathetic to several aspects of this program, supportive of several elements of it, notably the concepts of local initiative and small-scale development that are involved in these projects, and we recognize that many loans, though not all, have upgraded existing systems and reduced water distribution losses.

But not all the projects are environmentally benign, and larger projects are now more commonplace. We believe that several policies embodied within the program deserve careful scrutiny before this major authorization is approved by the Congress.

I will just summarize our recommendations for improvements in the program and amendments to the legislation.

I note with interest and appreciation the support of the administration for the modification of the interest rate formula for that portion of loans that are interest bearing, and their interest in exploring an amendment to the legislation to deal with the conflicting program objectives with regard to water resources development and surplus crops.

In addition to those two important areas, we would recommend the following issues be addressed in this legislation. We believe that there should be established an appropriate level of interest for all new loans for irrigation. I can't think of a State that more enthusiastically embraces water resources development than Colorado, and you just heard that Colorado's own fund involves repayment at 5 percent interest.

We recommend that there be a 35-percent minimum non-Federal share for overall project costs. We recommend that direct transfer of funds to Federal fish and wildlife agencies for studies and reports required under the Fish and Wildlife Coordination Act be incorporated into the legislation. And we recommend that there be developed a cost ceiling and comparable reform measures for loans authorized under Public Law 84-130, which is the Bureau's other major loan program encompassing distribution and drainage facilities.

We look forward to working with the committee on a bill that we can support.

[The prepared statement of Mr. Osann on S. 1171 follows:]

NATIONAL WILDLIFE FEDERATION
1412 Sixteenth Street, N.W., Washington, D.C. 20036 202—797-6800

STATEMENT OF EDWARD R. OSANN
DIRECTOR, WATER RESOURCES PROGRAM
NATIONAL WILDLIFE FEDERATION
ON S. 1171
TO AMEND THE SMALL RECLAMATION PROJECTS ACT,
BEFORE THE
SUBCOMMITTEE ON WATER & POWER RESOURCES
COMMITTEE ON ENERGY & NATURAL RESOURCES

UNITED STATES SENATE

July 16, 1985

My name is Edward Osann. I am the Director of the National Wildlife Federation's Water Resources Program. The Federation is America's largest conservation organization with over 4.5 million members and supporters nationwide, and 52 affiliated state and territorial organizations.

Mr. Chairman, I appreciate the opportunity to testify on S. 1171. This bill would double the appropriation ceiling for loans under the Small Reclamation Projects Act of 1956, from $600 million to $1.2 billion. Let me state at the outset that we are sympathetic with several aspects of this program, notably the concepts of local initiative and small-scale development inherent in these projects. Furthermore, we recognize that many loans have upgraded existing systems and reduced water distribution losses.

However, not all loan projects are environmentally benign, and larger projects are now more commonplace. Several policies embodied within this program deserve careful scrutiny before Congress acts to sharply increase its authorization. My testimony will be directed toward these specific policies, and toward recommendations for reforms that would produce a more balanced and responsible program.

Environmental and Economic Impacts of Interest-Free Irrigation Loans

Environmental Impacts

The majority of funds loaned under the provisions of the Small Reclamation Projects Act are directed to water projects intended to supply irrigation water. Irrigation loans under this Act bear no interest if they provide water to individual farms below the generous acreage limits set by the 1982 Reclamation Act Amendments. Over the long run, this policy has detrimental effects upon water resource management by undercutting water conservation efforts. The biggest single consumptive use of water in the United States by far is irrigation. By shielding water users from the true cost of federal irrigation loans, the Small Reclamation Projects Act loan program encourages higher levels of investment in new irrigation projects than would otherwise be the case. The public subsidy to private developers inherent in the no-interest loans skews project selection away from the most cost effective investments toward those with marginal benefits. This results in the scarce water resources of the West being appropriated by projects of questionable priority. Water waste instead of conservation may be the outcome.

Providing federally subsidized irrigation water to farmlands where surplus crops -- targeted for Department of Agriculture crop reduction programs -- are grown is a glaring contradiction which should be addressed by this subcommittee. This muddled policy was specifically dealt with in a February 1984 report entitled "Production of Surplus Crops on Irrigated Land Served by the U.S. Bureau of Reclamation." This report was prepared by the Economic Research Service of the Department of Agriculture, as mandated by Congress. The report concluded that the simultaneous priorities of encouraging farmers to grow more crops by providing subsidized water and discouraging farmers to plant more crops through set-aside programs are costly, contradictory, and inefficient. In our judgment, S. 1171 should be amended to remedy the contribution of the Small Reclamation Projects Act to this underlying contradiction between the Reclamation program and USDA commodity programs.

As projects funded by Small Reclamation Project Act loans have grown, so have the responsibilities of fish and wildlife agencies to meet the requirements of the Fish & Wildlife Coordination Act. Timely participation by wildlife agencies in the planning process can avoid controversy and delay at later stages of project development. We recommend that the Secretary be directed to transfer funds to the Fish and Wildlife Service or the National Marine Fisheries Service, as the case may be, for studies and reports on Reclamation loan projects pursuant to the Fish & Wildlife Coordination Act.

Economic Impacts

The economic equity, efficiency, and appropriateness of extending interest-free loans to one region of the country should be examined by this committee. The amount of government revenues lost through lack of interest on repayment of long-term irrigation loans is substantial. The justification for this policy in light of the burgeoning federal deficit is hard to fathom. Additionally, the fairness of allocating interest-free irrigation loans only to the 17 Western states and Hawaii is questionable. Similar irrigation loan programs administered nationwide by the Farmer's Home Administration (FmHA) under the Department of Agriculture have interest rates based upon the full cost of borrowed funds. Even FmHA loans made to low income and beginning farmers require interest, though at a reduced rate.

Prospective recipients of Small Reclamation Projects Act loans are not required to establish a documented financial need for these subsidized loans. On the other hand, applicants for loans under FmHA programs must pass a stringent "credit-elsewhere" check in which inability to obtain credit at other established banking institutions must be shown. It should be noted that local sponsors for three of the six new Small Project loans approved in 1982 had a bond rating of "A." This indicates that a strong investment market -- apart from federal loans -- exists for these sponsors, the Fallbrook Public Utility District, Ramona Municipal Water District, and Yuba County Water Agency.

These policy contradictions result in certain water developers in the Western states receiving government loan subsidies generated by taxpayers nationwide. Action by Congress should be directed at realigning the Bureau of Reclamation's loan programs in order to achieve a fiscally sensible loan policy which encourages resource conservation.

Lack of Cost-Sharing Requirements

The Small Reclamation Projects Act contains no provisions for minimum up-front cost sharing on the part of loan recipients, except for a $1,000 loan application processing fee.* The National Wildlife Federation has consistently supported the concept of cost-sharing as a key ingredient in improving the selection process for federal water projects. Requirements for greater non-federal cost-sharing in the Bureau's loan program can be useful as well, resulting in more careful non-federal review and evaluation of proposed projects.

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*If adjusted to account for increased costs since 1956, this fee would approach $5,000 today.

The report by the House Committee on Interior and Insular Affairs on H.R. 4444 in the 98th Congress stated that the average non-federal share for loans over the past 10 years has been 20%, and up to 40% for single-purpose irrigation projects. However, as the accompanying table shows, cost-share levels for several of the most recent loans approved under the Small Projects Act vary widely:

Loan Recipient	Total Project Cost	Total Federal Loan	Percent Cost-Share
Fallbrook Public Utility District, CA	$12,965,000	$12,065,000	7%
Buffalo Rapids Irr. District, MT	1,485,000	1,400,000	6%
Roosevelt Irrigation District, AZ	10,810,000	10,515,000	3%
Ramona Municipal Water District, CA	22,319,000	18,919,000	15%
Columbia Irrigation District, WA	4,264,000	3,306,000	22%
Yuba County Water Agency, CA	28,236,000	21,482,000	24%

These figures come from an October, 1982 Department of Interior news release. We believe that a 35% cost-sharing requirement for local project sponsors would make limited federal dollars go further, and would provide corroboration from the marketplace for the Bureau's findings of feasibility for loan projects.

Inappropriate Rate On Interest-Bearing Loans

Portions of some loans under the Small Reclamation Projects Act do bear interest. These consist of loan amounts allocated to municipal and industrial water facilities, hydroelectric power, fish and wildlife enhancement, and public recreation. The interest rate on these loans was set by a 1966 amendment (P.L. 89-553) at the average "coupon rate," a figure which is now 1 to 2 percentum below the average "market yield." The market yield formula more accurately reflects the rate the Department of the Treasury will pay to borrow money in order to provide funding for programs such as irrigation loans. The following are recent precedents for adoption of the "market yield" formula for computing interest rates for water project repayment:

1. Department of Energy Order RA 6120.2 - delineates use of market yield as the interest rate for repayment of federal hydroelectric power projects, October 7, 1983.
2. Hoover Power Plant Act of 1984, PL 98-381;
3. Reclamation Safety of Dams Act Amendments of 1984, PL 98-404;
4. Colorado River Basin Salinity Control Act Amendments, PL 98-569;
5. Comparable FmHA loans. The Soil & Water and Irrigation & Drainage Association loan programs both base interest rates for loan repayment on the market yield formula.

Continued use of the lower coupon rate for amortization of interest bearing loans will result in substantial losses of Treasury revenues.

NWF Recommendations

We urge that the following issues be addressed in legislation dealing with the Small Reclamation Projects Act:

1) Restore the "market yield" rate as the standard repayment rate for all new loans now required to bear interest under the Small Reclamation Projects Act.
2) Establish an appropriate level of interest for all new loans for irrigation.
3) Require full interest, as determined in (1) above, for new loans for the delivery of water to surplus crops.
4) Set a 35% minimum non-federal share for overall project costs.
5) Direct the transfer of funds to Federal fish and wildlife agencies for studies and reports required under the Fish and Wildlife Coordination Act.
6) Develop a cost ceiling and comparable reform measures for loans authorized under PL 84-130, the Bureau's other loan program, encompassing distribution and drainage facilities.

Conclusion

The National Wildlife Federation is opposed to the enactment of S. 1171 in its present form. We urge the committee to consider the amendments we are recommending for the Small Reclamation Projects Act which will advance both recovery of government revenues and natural resource conservation.

We look forward to working with this committee on a bill that we can actively support.

Mr. **Brown**. Very good. Thank you, Mr. Osann.

Dr. Allee.

STATEMENT OF DR. DAVID J. ALLEE, PROFESSOR OF RESOURCE ECONOMICS, CORNELL UNIVERSITY

Dr. **Allee**. Thank you, Mr. Brown.

Mr. **Brown**. Please move the microphone over.

Dr. **Allee**. I'm getting used to a humid climate again, and I appreciate the use of the microphone.

I'm David Allee, professor of resource economics at Cornell University, and I have submitted a preliminary draft of a report to you, and I hope within the 2-week limit to get a finalized draft to you.

This comes from material developed on a Cornell project on water supply—the testimony, that is. We also hope to produce a lengthier report that would also be of interest to the Bureau of Reclamation, and hopefully to develop a think piece, a concept paper on the application of a similar program to the one that we're discussing today, the CERPA program, to the eastern situation.

As you know, Senator Moynihan of New York has been very interested in a similar kind of a program, has offered it in the corps' omnibus bill. And as I understand it, he intends to look for another way to see if that kind of a program can't move forward.

Congressman Nowak of Buffalo's office is also very interested in it, and I'm impressed by their concerns and interest. So I'm looking forward to hopefully providing as a part of your friendly land grant support system some material for their use.

I've been on sabbatic leave this last 6 months. The Bureau of Reclamation was kind enough to provide me with some office space and some support for one of my graduate students and some travel funds. Otherwise, this has been supported, this work has been supported largely by the New York State Agricultural Experiments Station and largely by funds from the State of New York.

I've carried out roughly 60 interviews with people like Mr. Fetcher and Mr. Younquist. I didn't happen to include them in the sample that we drew. It's a very structured sample in terms of getting projects that are doing interesting and different things. We were looking for diversity. And I must say I'd like to visit with them, because I think these two projects represent the best in what this kind of a program can produce, and that is indeed very good.

We're also developing a data base on that project that has been developed in the past, and we will summarize some of that information and certainly make it available to you.

A number of things I think are very impressive about this program. One is the degree to which local governments themselves get involved and community leaders. They work through private consultants. They feel like they control the results. And in these days of big government, that is something that I must say strikes a responsive chord, I think, in terms of that.

This is a program intended for that big group of mutual water companies out there in the districts who are formalized versions of these cooperative ventures on the part of farmers to provide themselves with water. Eighty percent of the organizations that provide water and roughly 25 percent of the water that's provided for irrigation moves through these kinds of organizations. As I'm sure you realize, something like 40 percent of the water of the Nation is pumped and pumped by private individuals; 60 percent is surface. So we're talking about that part of the surface supply that is provided by local community organizations.

The stress has certainly been on multiple-purpose projects and objectives, multiple interests, if you will, and I think the rationale for Federal involvement is not so much to create more irrigated acreage; indeed, it would probably—this program creates very little additional acreage, but perhaps 1 percent of the acreage that is irrigated by a project here is actually new land. Mostly this is the refurbishment, the modernization of old projects.

The Federal Government has a stake in seeing that that process develops in a way that represents the interests of the wider community—interest in wildlife, interest in fishery habitat improvement, interest in kinds of problems that the Kesterson Reservoir situation represents.

And my own sense of that is—and I'm an economist; I'm not pretending to know a damn thing about where selenium might show up—but I certainly recognize that day after day we found another trace element, we find another pesticide problem. We find—as you may know, Long Island has about 26,000 acres of land contaminated by temic. So we're rather sensitive to the possibilities of something happening—in other words, moving into the modern age.

The Federal Government, just as in the case of supporting sewage treatment renovations, supporting industrial polluters to find ways to solve their problems through various tax breaks that they've gotten, I think is going to also play a significant role in facing up to the some 25 or 35 percent of the irrigated land in this Nation that currently has, possibly has a salt problem, and that I think is an indicator of other possibilities.

Well, getting off a little bit on this, the local management and lower costs have been stressed by two of the folks, the two folks that have been involved with local projects. If the folks from Galesville hadn't been here, I would have used them as an illustration of the kind of risktaking that local people are willing to take on when they've got a few extra bucks to work with. In that case you've got a significant—you've got a demonstration of a significant technological change in the way in which you build a dam. Roller-compacted concrete is something that makes the engineers in this process salivate, but it's been slow in coming, and to get somebody to try it on a reasonable scale is pioneering kind of work. And you can take those kinds of risks when you've got the kind of support that this program has both fiscally and technically.

I was very impressed with the Fallbrook project. They're building—I thought when I first saw it that it was a place for a professional football stadium. It looked rather like it. It was in southern California, and those southern Californians do all kinds of crazy things. But it turns out, no; they're going to put water in it.

And I'll admit they would have had a little parking problem if it was going to be a football field. They were very proud of how cheaply they had built that project, because they were able to essentially act as their own contractors. The head of the district is a retired naval officer who had run projects like that for years, and he was assisted by a very able young man who frankly had once worked for the Bureau of Reclamation and thought private sector interesting. It's a public district, but we still seem to call that the private side.

Another, I think, good example is the Gila River farms. This is one of the Indian projects, and this program is probably the only place that people involved with Indian projects have been able to find—to support water and land development.

There are some other possibilities on the horizon, but at least in terms of an ongoing program, this is the place that Indians can go for money. And they have taken on the leveling and the ditch-lining functions that are associated with that development. It's complementary to their labor force development.

It fits in terms of training Indians, developing more skills in the Indian labor force, which is one of the objectives of their program. And I think it's a nice illustration of how a program like this can do things more cheaply, more effectively, and achieve multiple purposes, multiple objectives that the traditional large Federal project can't do, at least not as well.

The Federal money here is essentially to get them, get the local folks to do things that they might like to do but can't otherwise do. Yet there is—there are some problems, as you might expect.

Minimization of Federal financing is something that is very fashionable to worry about, and it is certainly one of the goals that's embedded in the 1957 legislation that you're working from. But there are more things there than simply the goal of financial feasibility. And the language says the Secretary shall give due consideration to financial feasibility, emergency or urgent need for the project.

Financial feasibility gets a lot of attention. Emergency or urgent need for the project, I would suggest, has not been stressed as strongly in the implementation of this program, and certainly should be reviewed, I think, more carefully.

Conjunctive use of ground and surface water, reuse of sewage and other impaired supplies, fishery and recreation features, shifting water from irrigation to municipal use, facilitating that in areas where that's needed, preserving agriculture as an open space in urban areas—that's a little different kind of a problem, tends not to happen in the same ones.

Slowing the shift to large corporate farms, supporting the economy of otherwise depressed communities, substituting conservation for supply expansion, these are all desirable things and get done now largely because the managers of these projects can put a package together with zero-interest money.

If you didn't have zero-interest money in there, I would submit you would have to to get these things done. You would have to add a grant feature, which might be a good idea to consider because you might that way target more specifically on some of these very valuable, I think very valuable things that local people are not—now have to finance and carry out when they're looking at their narrow water supply needs and their rather limited financial resources.

Some projects, of course, have extensive financial resources. There are rich irrigation districts in this country. There are rich mutual irrigation companies, but the greater bulk of them, that's not the case. The typical rural community is caught in a financial bind, where the rise in interest rates, the traditional people that buy municipal bonds have fled the market. There new people have come in. It's a different kind of a ballgame.

Proposition 13, I don't have to tell anybody from California the impacts that that has had, and by and large, it's had more impacts on the small rural communities than on the large urban ones.

So I think your needs for financing are different than they were in 1957, but they're still very real, and indeed, you may want to look at some restructuring of how you provide that money.

One of the things that is done, of course, in some programs is to put in some sort of a means test. The Farmers Home Administration—and in my written statement I give you quite a lot of detail on how the Farmers Home Administration approaches that and several alternatives to that.

But I would suggest that you don't look upon that as the perfect model by any means. That's a single purpose program to provide facilities for the municipal setting. It's not so much—there has been some irrigation work done on it, but that tends to be the exception. And remember, their use of a means test is essentially to leave them in a position of a lender of last resort.

And I would suggest that on the Fallbrook kinds of situations where there is assessed valuation and a high ability to pay, you may still want to try to influence how those projects come about. You are in the multiple-purpose water development business, water management business, and to get the Fallbrook people, for example, to pay close attention to the needs of the environment, and particularly some of the habitat improvement opportunities that they have that can be fitted together with this kind of a project, the involvement of those Federal dollars is mighty important.

Personally, I have very little faith in the ability of regulatory programs to achieve environmental results. I am more persuaded that bribery is the way to go, and coercion only works so far. But it seems to me if I have a few dollars, I can get much further in the process.

Let me come down particularly hard on the Kesterson kind of problem where I think the involvement is extremely important. Most of the environmental problems associated with irrigation are solved if you get at the conservation problem. If you limit the amount of water applied only to that that's needed in the root zone and prevent the movement of water over the surface of the land or through the land into the receiving waters, you get rid of most of the environmental problems except for the 25 to 35 percent of the irrigated land that must flush out salt.

And once you have gone to that step, you then end up with water that you've got to do something with, because the very purpose of having it flushed through the soil is to get rid of something that you don't want in that soil. And basically you don't want whatever that is anyplace else much either.

So some place in the neigborhood you've got to find a solution, to make a bad pun, for that water that you've got to get rid of. It's got to go somewhere, and it's a problem, as I say, the 25 to 35 percent of the irrigated land of this Nation has got to face up to in the next decade.

We aren't going to go any faster with this problem than we have with many others, but a program like this, properly structured and where the financing is properly provided, can lead the way. And I might well ask if this program doesn't do it, I wonder who will.

It's—the scale of these projects fits this kind of experimental risktaking developmental process that I think is particularly needed now. I don't think we're really going to solve all these problems with the huge projects. The small projects are going to probably show us the way.

In the area of sort of conventional wisdom in the water game, one of the things that's regularly raised is that there are just too many water management agencies around. We've literally got hundreds in almost any locality that you look at carefully.

I think the conventional wisdom a little wrong in this. What we've got, there are many different organizations representing their members and their interests on the demand side. And incidentally, they supply water on the supply side. Most of them, if they can maintain their representational role, are quite happy to talk about cooperating, going together with a county, for example, as in the case of Douglas County, and getting the advantages of a large project.

The Stagecoach project has a lot of the same kinds of features to it, opportunities for a number of different local purveyors or water entities to come together and share the gains of joint action.

But, you know, when you try to get a group of people like this in the local scene together to cooperate, rarely does everybody have the equal need to move ahead. And, again, I turn to the concept of bribery: dangle a few Federal dollars out in front of them, and you can get more cooperation than you would otherwise. Maybe you're dangling too many dollars in some cases, but I suspect in many cases you aren't dangling enough.

So one of the things that I would suggest is that you consider specifically grants in the consolidation area. I say this particularly if you're going to raise the upfront requirements, if you're going to raise effective net interest rates on the projects, a number of other things—and I can see merit in a lot of the arguments for those. But I suggest that, for example, in the consolidation area or in the risktaking function on the new conservation steps, the Kesterson kinds of problems, a specific, targeted grant program is of value.

In the area of fish and wildlife opportunities I have been regularly appalled at the lack of communication at an effective time between those interested in improved habitat and those water managers who have an opportunity to provide better habitat.

Now, willy-nilly you can produce some habitat whenever you store water, move it around, let it leak out the sides of canals or whatever. You're going to have an impact on habitat availability. But the opportunities to capture some of the unique values that are available out there to water managers are—well, let me give you an example.

The Carmel River runs through one of the most sensitive communities for environmental values that we've probably got in the

United States. A considerable amount of water was developed on the Carmel River by the California-American Water Co. Their proposal is currently to take the two small dams, essentially diversion dams on that river, and increase their size. This would threaten the steelhead run. This is the most southerly widely recognized steelhead run we've got on the Pacific coast. And when you consider the millions of dollars that the Corps of Engineers, and I think quite reasonably, has spent on trying to establish and maintain those runs in the more northerly rivers, the most southerly one has a unique character, even if it didn't happen to be in the Carmel community.

There's probably going to be a project developed there. The Bureau is not in touch with this group as far as I know. This is just one that I happened to run across and developed as a stocking horse for the potential. Chances are quite good there will be no irrigation development unless the Bureau does get involved. There is some potential, not much.

But I would suggest that there is a good possibility that even in the wealthiest State of California that a few additional dollars in the name of the fishery development would be a mighty valuable thing in terms of bringing off a multipurpose water development project that has, to my view, very unique fishery values. This is the kind of program that could get that kind of thing done, that you could hold responsible for being that kind of a doer in the water management area. Most irrigation projects would just as soon not worry about fishery values. Thank you very much. Those are—you know, somebody else gets the benefit for those. You're trying to run an irrigation farm. These days you've got enough to worry about without that. It's these kind of programs that are going to make sure that kind of thing happens. I have a section in my prepared material on the Indian projects.

Let me say I spent a number of days visiting folks involved with the Indian projects. I was particularly impressed by the potential that the Navajos have. As I said, under present arrangements they are not aware of other opportunities to finance water development at the small scale. They have—the Navajos probably have a potential for 50, maybe 60 projects in the 4,000 acre range.

This is a level that meets the needs of Indians who are trying to develop skills, trying to develop management capability at a level that—well, the Navajos themselves, I was told I don't know how many times that they needed these loans to give them the kind of discipline that they need. In other words, they would have to meet a repayment, that this was important for their developing operating organizations that can do that. Get them out of the welfare syndrome.

One last point. It's outside of the scope of the study that we're working on, but I do have some background in the agricultural surplus area. I can sympathize with the symbolic notion that these are, you know, the idea of surpluses on the one hand costing the Government a lot of money, developing irrigation capacity on the other hand.

I think in reality these are so separated that in fact the price and income instability problem of agriculture is not going to be materially affected. Even if you made every irrigator pay the real cost of all irrigation development, we would still have just as much variation from year to year, from decade to decade in farm incomes as we have now. It's simply not that relevant to the organic problem.

Thanks very much for the opportunity say a few words, and particularly the cleanup matter.

[The prepared statement of Dr. Allee follows:]

Alternative Incentives to Encourage Desirable Irrigation Projects Under the Small Reclamation Projects Act Loan Program

By

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Introduction

This is a preliminary report based upon some of the material collected under a Cornell University Agricultural Experiment Station project in water supply management. The primary emphasis of the project is to evaluate the so called infrastructure problems of municipal water supply in the rural Northeast. Western experience in irrigation supply maybe relevant, thus, this review of the Small Reclamation Projects Act (SRPA).

It is not surprising that investment has fallen and disinvestment through differed maintenance has increased. In the face of property tax resistance, a structural shift in both the supply and demand sides of the market for local government securities that, along with inflation, raised bond interest rates dramatically, something had to give. As a number of studies at Cornell and elsewhere have shown, the small rural communities that support much of the farm sector, are prone to significant water supply problems in terms of quantity, quality, reliability, affordability, and other measures. The issue in this project is what to do about it.

In addition to analyses conducted in the East, particularly in New York State, it seemed advantageous to study a program that had been suggested for duplication in the East by Senator Moynehan of New York. The author's sabbatic leave allowed for this review. The Bureau of Reclamation was kind enough to provide some office space, several months of salary for a graduate research assistant, and travel funds. The principal support for the project was from the New York State Agricultural Experiment Station. Work supported by the Environmental Protection Agency and a program now in the Geological Survey also contributed to the background for this project.

While on sabbatic leave the author was able to interview over sixty informants selected because they were knowledgeable about the Small Reclamation Projects Act (SRPA) loan program. Also, a computerized data base is in the process of being developed. A more detailed report reviewing the SRPA program will be issued in the fall and after that a report will be prepared on the concepts that should be taken into account in any similar program for the East.

The enthusiasm of knowledgeable western water practitioners for the SRPA program is very impressive. It is viewed as a program where the local sponsor is very much in charge. Local leaders with the assistance of their consultants make the key decisions within the SRPA rules. Federal grants are prepared for flood control, recreation, fish and wildlife, and interest bearing loans for part of these, water supply and hydropower features,plus the zero interest feature on irrigation are major financial features. They provide the scope to achieve objectives important to the managers and recognized professionally but not always easy to sell to developers and other local interests. More detail on these largely unrecognized benefits of the program is given below.

The program is managed with a minimum of red tape; generally the technical reviews are seen as competent and not as drawn out as for other Federal projects. Local control of construction and the incentive from the local interest, both fiscal and managerial, lead to speed and efficiency in planning and construction. The program is managed by only a little over a dozen professionals and help from other parts of the Bureau of Reclamation. Their commitment to the program is widely regarded.

Background

The original $600 million authorized in 1957 is exhausted with 132 projects that have been or are about to be funded. Authority for an additional $600 million is being sought in pending legislation (S. 1171 and H.R. 2025). The first 124 projects averaged $3.9 million and the last eight will be over $12 million on average. In 1985, $55 million was appropriated. But due to the inflation there won't be that many projects from the next $600 million, even with the current higher rates of local cost sharing. Local shares of 15 to 20 percent in current financing have been common.

This reflects some increase in the size of projects interested in rehabilitation. The last 37 projects, six years of new starts will average 26,000 acres in size. This totals 956,000 acres with more secure water supply or roughly 2 percent of the nations irrigated acreage, a tenth of that receiving some water due to Federal assistance. Very little new land was brought under irrigation in most of these projects. Most are small projects with small districts, half are about 10,000 acres or less. Some are small projects with large districts, one tenth are in the 90 to 110,000 acre range.

The vast majority of farm ownerships are below the 960 acre limit considered excess land under reclamation law. Most projects have gone to districts composed of predominantly modest sized farm businesses, something the acreage limitation indicates only very imperfectly. A better data base on these projects would be helpful here.

The natural client of the SRPA program is the irrigation organization which is usually concerned with surface water distribution either exclusively or in conjunction with ground water. This is only part of the 48 million acres or so that are irrigated in the west. Individual private wells dominate ground water use. Surface water withdrawals have held about steady around 88 million acre feet in recent years. Ground water was at 56 million acre feet in 1975, or two-fifths of the total, and growing rapidly. It is however, of increasing concern to organizations as the opportunities for conjunctive management are recognized. A number of recent projects have facilitated the take over of private wells by irrigation organizations. But about 25 percent of surface water diversions are carried out directly by the user under senior rights to the summer flow. Thus, something over 45 percent of the irrigation in the west is supplied by irrigator run cooperative management organizations. About one-fifth of all irrigated acreage receives some or all of its water from Bureau of Reclamation projects already. Those that remain, 25 percent of the acreage, or 12 million acres, are the potential customers for this program.

Under current laws and regulations, small reclamation projects are developed under various rules and cost sharing designed to encourage desirable projects. For example, lands to be irrigated must be certified as having soil and climate likely to allow successful farming. Organizations acting as sponsors have to have adequate powers to manage a project. Flood control, demonstrably difficult to fund locally at adequate levels, is liberally cost shared. Local commitment and financial feasibility are encouraged by limiting the Federal subsidy for water supply to 50 percent on a present value basis (the so called loan factor) and requiring that the full farm repayment capacity is utilized. Also, local sponsors have to fund planning initially and are able to effect many cost controls through direction of construction as well as planning. Reviews of engineering by the Bureau protect the Federal investment from technical errors.

Interest free funds for irrigation water supply allow local public officials and community leaders with the help of their consulting engineers to put together projects that achieve desirable water management practices, many project elements they could not achieve with the funding available to them otherwise. A common situation is where one entity, say an irrigation district, needs more capacity but by itself cannot mount the best available solution. Typically those who might share in the project are not as ready to act but the prospect of the Federal funds moves the beneficial cooperation along. Besides facilitating cooperative and lower overall long run costs, political and technical risks are made easier. Few irrigation projects would include fishery features without significant inducement. Conjunctive use of ground and surface water, reuse of sewage and other impaired supplies, fishery and recreation features, shifting water from irrigation to municipal use, and preserving agriculture as open space in an urbanizing area,slowing the shift to large corporate farms, supporting the economy of an otherwise depressed community, substituting conservation for supply expansions or the adoptions of new technology that needs to be tried before it is accepted, all of these and other desirable measures have been made possible by the zero interest feature and by packaging them with the irrigation water supply. This is particularly significant where local circumstances make these steps unusual or innovative.

Many times the Federal Government is the only source of loan funds for a public entity to borrow for resource development. Some Indian project developers are seeking the enterprise building discipline of a loan, yet one that is at a level where the development of managerial and technical farming skills are possible. Not being able to pledge land to secure bonds the tribes are dependent on this program for irrigation development. But there are many existing irrigation farming situations that face fiscal opportunities as bleak, or nearly so, as those of Indians.

Remember 80 percent of the irrigated land in the west receives no federally subsidized water today and much of that 80 percent was developed many years ago. Facilities are old, wasteful, and worn out. And like the Indians, there are situations that can best be handled in small increments as people are ready to face the task.

But many were developed in a very different economic setting. While not subsidized by Federal funds, they were funded by investors that either never did get their money out or did so only over a very long period of time. Facilities that were built with cheap money face the prospect of replacement and modernization with very expensive money often where the local entity hasn't the financial rating to sell bonds at all. Indeed this comes at a time when the market for local government securities is in disarray and the small rural governments are at a particular disadvantage.

The challenge to sort out those projects that should continue and those that should not is very great. Not only are there farm businesses at stake, but also communities that depend upon those farm business for their viability. At present the requirement for full use of the repayment capacity to repay the Federal loan and to the limit of the Federal subsidy on water supply at 50 percent of the present value of the cash flows impacts on the choice process. Essentially, small projects for small districts of only moderately well financed farmers with no high value crops and no opportunity to share costs with M&I and hydropower customers are at a significant disadvantage. Without partial state funding they usually cannot qualify for a SRPA project. Projects in urban areas and that enjoy high value crops are not as restricted by hose policy measures. Proposals for greater up-front contributions, interest payments on water used on surplus crops, or interest on all irrigation water supply would further this bias in the program.

Whether or not measures are adopted to reduce Federal financial contributions, or to penalize the growing of surplus crops, consideration should be given to alternative incentives to encourage desirable features of irrigation projects under SRPA (Public Law 84-984).

Eligibility Measures

There is some reluctance to provide Federal funds to local sponsors who are both quite capable of borrowing at reasonable rates elsewhere and likely to do so if denied the Federal funds. This reluctance is not shared by those who view such programs as a question of fair shares, i.e., if others got interest free money for irrigation development they should too. Eligibility measures have been successfully used in other programs to either exclude some participants or to provide the basis for more liberalized treatment of some participants.

Farmers Home Administration (FmHA) has long served as a lender of last resort for rural municipal water supply and waste water treatment. An applicant, in addition to having a population under 10,000 people, has to demonstrate to the satisfaction of the Administration that they cannot borrow at a reasonable rate from other lenders. Statements from bankers and brokers,data on debt load compared to income and property values, and relative incomes are used to provide a basis for a case by case decision. FmHA has successfully resisted the use of arbitrary measures to define an unreasonable alternative loan such as 2 percentage points over a Triple A bond rating. Such an approach could be used to to provide a threshold for when higher levels of up-front cost sharing or extra interest charges would not be applied. Note the FmHA also gives priority to communities under 5,500 people, for rehabilitation of infrastructure, consolidating municipalities and those serving significant low income areas.

Interest charged is varied by the median family income in the project area. Below the poverty levels, interest is 5 percent; over the state non-metropolitan median income, interest is at market rates, and for local median incomes between poverty and the state non-metropolitan median an intermediate rate is charged.

Finally, the size of the FmHA loan may be reduced by a grant depending upon the local median income and the relation of user charges to that income. Communities with poverty level median incomes and below are expected to pay user charges up to 0.5 percent of their income; over 80 percent of the state's median and no grant is available to reduce the size of the loan. Communities with a median income between the poverty level and 80 percent of the state median outside of metropolitan areas are expected to pay one percent of the median income for water service. While such neat relationships between payments and income may not be feasible for the highly diverse irrigation situations the principle of differential grants and interest rates should be explored.

One approach to determining the ability of local entities to borrow is to consult the bond rating services. However, very few small communities find it feasible to have themselves rated. The cost wipes out the benefit if any, and often they know they cannot obtain a favorable rating such as A or Aaa. An alternative is to draw a sample of perhaps 200 communities in a state to use at a standard for credit measures and indicators of likely problems in borrowing. States differ so greatly in terms of local finance arrangements that multistate samples are to be avoided. Studies of financial capacity have shown three indicators to be sufficient.

1. Current debt per capita
2. Ratio of per capita debt to per capita income
3. Ratio of current debt to full valuation of taxable property

An entity that fell above the state sample average in two or three of these measures would have a high probability of financial difficulty. Below average on all measures promises little financial difficulty. Above average on one measure suggests caution.

Recommendation on Means Test

SRPA provides the potential for integrated management of complex water resource situations, therefore a "lender of last resort" role is not appropriate. The Federal Government is not simply in the business of expanding or stabilizing irrigation. But a "hardship" test would be valuable to determine cases where waiving various stringent fiscal requirements such as the loan factor, usual local cost sharing, full use of the repayment capacity, and to establish developmental periods where repayment is reduced. The Bureau of Reclamation should be given authority to develop such "hardship" criteria and be required to document its use in such cases. This is consistent with the "case by case" approach to cost sharing established in the so called "Laxault letter" and reaffirmed by the Secretary of Interior on several occasions.

Special Handling of Funding of Conservation innovations

Water quality impacts of irrigation, water use efficiency, energy savings, erosion and sedimentation, coordinated use of groundwater and surface water, water reuse including the use of sewerage and other conservation innovations are in many cases inter-related. Achieve one and you get some of another, cheaper. They often require some inducement to be fully implemented at both the farm and district level. In most cases the zero interest loan is a sufficient inducement to overcome the impediments caused by perception of risk, the uncertainties of new technology, the higher discount rates that individuals and localities apply to investments as compared to the nation as a whole, the lack of incentives because water and energy cannot always be put to an higher value alternative use by those who save them, and because the benefits to others of these actions are often difficult or impossible to turn into cost sharing from those benefitted. Encouragement from consultants, farm advisers, and existing rules and regulations have produced many projects that have made major strides in achieving these modern conservation objectives.

However, the SRPA program has the potential to achieve more if there were clearer statements of modern conservation objectives on the part of the Congress, the basic policy making body of the nation. This should be translated further into authority to provide modest facilitating grants for these purposes over and above the zero interest rates for irrigation, and excluded from the computation of the loan factor. However, the computation of the grant should take into account the benefit to the individual irrigator of the conservation practices and the restraint on the adoption of the practice due to the commitment of repayment capacity, and benefits beyond the fiscal participation in the project.

In other words, the irrigator should be held accountable to pay for those benefits which he should recognize as profitable in his business, computed at the discount and interest rates he would be expected to use in that business. Similarly other beneficiaries who can be made a part of the project fiscal package should be expected to pay for values they receive and on terms most everyone should recognize as fair. The Federal grant should be just enough to insure that desirable conservation features are in fact achieved, and that the interest of those who practically cannot be a party to the project are vigorously represented by the Bureau of Reclamation. Grants should not be needed in most cases and in those where they can be justified they could be limited to 10-20 percent of project costs for irrigation.

Management of Environmental Problems from Irrigated Land 1/

SRPA has potential for many projects in the future that would deal with the rapidly emerging environmental problems of irrigated agriculture. SRPA's advantage is that the scale of the projects fit the scale at which much action must happen to facilitate changes at the farm level.

As many students of the problem have concluded, the nature of the problems, their importance and the appropriate corrective measures vary widely among and within regions. National, even state standards in some cases, and uniform control measures are inefficient and costly. Water conservation is the solution to all major environmental problems except salt buildup in the soil, where _flushing the salt somewhere must be dealt with in a neighborhood specific way_.

The recent concern for salinium in the Kesterson Wildlife Refuge due to the failure to provide an adequate disposal for drainage water is a case in point. To a greater or lesser degree, the potential for such problems exists with 25 to 35 percent of the irrigated acreage in the west.

Perhaps the most effective potential means to achieve conservation is to facilitate the compensation of the farmer for unused water that in fact has a higher value use. Increasing the vendability of water depends in part upon changes in state water rights administration. This is beyond the scope of the SRPA program, More to the point, is the fact that for greater vendability and for more effective conservative in many irrigation areas, some changes will be desirable in the system that collects and distributes the water to the users. Even with full vendability there will be some remaining environmental problems, more in some cases than others. Thus, there will be a need to induce changes beyond what can be achieved with education, technical assistance, and the few regulatory measures that are apt to be found feasible. Incentives at the project level will have a role even after adjustments in water rights and other measures are taken, and until then, are one of the few approaches available.

Salinity is the most pervasive environmental problem in irrigation. On occasion this is combined with a heavy metal or other toxic constituent such as the selenium problem in the west side of the San Joanquin Valley. But one informed guess is that this is still only 25 to 35 percent of irrigated lands although the problem is growing. Outside of

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1/ In addition to interviews with key informants associated with SRPA projects this section drawn heavily from Frederick, Kenneth D. and James C. Hansen, Water for Western Agriculture, RFF, Washington DC, 1982.

the two large problem areas, Lower Colorado and Western San Joaquin, the problems are scattered and fit the scale of SRPA projects. Even within those large areas many of the larger than farm level actions needed fit the SRPA scale of project.

Erosion from irrigation occurs when flood and furrow systems are used on land not adequately leveled. About 35 percent of irrigated crop land is prone to either this or some other erosion threat. Changing the type of irrigation system, often encouraged by changes at the project or district level, is a means of reducing erosion. Two thirds of irrigated acreage is serviced by gravity flow and that includes 41 percent of the highly erodable irrigated soils according to the US Soil Conservation Service.

Perculating irrigation water appears to have leached nitrates into southern California aquifiers. Several areas have had problems with pesticides in return flows. Are these warnings for the future? Prudent irrigators should be interested in assistance that will ensure that their district has evaluated such risks and taken any reasonable and prudent steps to avoid problems. Just as in the case of domestic and industrial effluents it is reasonable to expect the Federal Government to encourage such steps. Unlike those cases, there is some considerable incentive on the part of the individual to share in the costs due to water and energy savings involved.

Tail water recovery systems improve application efficiency from 50-75 percent (assuming a 200 ft well pumping lift.) Energy costs can be reduced by 25 percent. As compared to unlined ditches and siphon tubes, underground pipe and gated pipes to deliver water to the furrows provide 16 percent higher application efficiencies saving from $4 to $12 per acre, depending on fuel costs. Water management, leveling, lining of canals can improve efficiencies of surface systems to 60 or perhaps 70 percent from a base of rarely more than 50 percent, i.e., gains of 20-40 percent over the base. Shifting to sprinklers can achieve 70 or 80 percent application efficiencies, gains of 40-60 percent over the base of surface system without improvements.

Scheduling services can be provided efficiently by off-farm specialists at $4 to $5 per acre. They pay for themselves in fuel cost savings and can be made much more effective if the delivery system is capable of controlling the timing and quantity of water. But many old canal companies cannot do so without renovation. Indeed, in many cases all the above changes are enhanced when carried out with changes at the district level.

Given the frequently repeated conclusion that higher water costs will encourage conservation, reduce the demand for supply development, and eliminate some if not most of the environmental problems caused by irrigation, why not simply eliminate or reduce the zero interest feature of Bureau of Reclamation projects or require irrigators to pay the full cost of water i.e., no subsidy from power revenues. In SRPA projects these steps would have little practical effect; indeed, they would be counter productive. First, there is little subsidy from power, and even less subject to Federal influence, in these projects. Second, when a district takes on a project it usually represents a major increase in the cost of water and with full use of the repayment capacity little additional water cost increase is feasible for the life of the loan, which is usually longer than the typical farmer planning horizon. Third, many projects that have alternative funding possibilities would be driven to plan formulations that would be less environmentally and conservation sensitive.

Recommendation on Environmental Quality

The SRPA program should be given explicit guidance to seek projects that will prevent environmental impacts. Cost sharing or measures to achieve environmental protection should provide for full participation by the landowner up to the savings accruing to the landowner or his water supplier. Grants to cover justifiable costs beyond those covered by savings to the landowner should be authorized.

Encouraging Multiple Organization Management of Water Resources

One tenant of the conventional wisdom about water management is that there is excessive fragmentation. Too many organizations are too small to gain the economies of scale available from managing the water system as a system. Cities and irrigation entities alike, consolidation and rationalization of collection and distribution facilities can save money, and increase effective water yield. But these are organizations that also represent the effective demand of their members as well as involved in trying to supply it. Unlike the private market there is no separation of supply and demand. As long as they do not give up too much in their capacity to represent that demand their members should be and are willing to consider consolidation or atleast federation, to achieve project advantages. But not everyone is equally ready for new capacity at the same time. Advantageous outside funding can speed up this cooperation as well as encourage the consideration of project features such as environmental enhancement, conservation, and the like, that would not otherwise came about.

In 1969 the last census of irrigation organizations identified a distribution by type. While unincorporated mutuals accounted for over half of the number of organizations they supplied only one-tenth of the total acreage supplied by organizations. Incorporated mutuals serviced about one-third of the land and were about one-third of the total number of organizations. Districts were a tenth of the total but served half the land. Districts frequently are the result of a merger of mutuals attracted to the municipal corporation form of organization by its taxing powers and debt financing advantages.

It is important to be clear about the likely Federal role in encouraging changes at the inter-local level of governance. Public districts and mutual companies operate under state law. In practical and legal terms, a Federal agency can have little to say about how local people organize to manage water. Nonetheless, it is well established that loans and grants should not be made to organizations that lack the appropriate powers to manage the project being formulated. Under this mantle and from the incentives provided by the physical development opportunities, which are often too much for one entity to handle, much cooperation has been achieved.

There has been a preference in the program to work with the lowest management unit feasible for the project. That is desirable. Only on very few occasions have we identified projects that might have been more successful if a more inclusive organization had been utilized.

Nonetheless, the Congress should consider giving more explicit guidance in this area, recognizing that funds to facilitate these desirable changes are important. Requirements for more local cost sharing, arbitrary limits an subsidies, and the like, reduce the potential to achieve these desirable results. On the other hand, under present rules there are times when more subsidy is paid than is necessary to achieve such changes.

Recommendation on Consolidation

The SRPA program should be given more explicit guidance and authority to provide grants to facilitate consolidation of facilities between water management entities. Grants should be limited to the incremental costs for consolidation not directly separable by purpose or use. Such grants should be limited to the irrigation interest and to use reimbursable shares of other functions, and follow the separable costs remaining benefits approach, except where a hardship determination can be made.

Unique Fish and Wildlife Opportunities Require Special Measures

Water resource management and fish and wildlife habitat are inseparable, but some projects have the opportunity to make truly unique contributions to habitat development. Unfortunately present arrangements and approaches make it unlikely that these truly unique opportunities will be captured. The existing arrangements for mitigation and enhancement and the long history of antipathy between irrigation and wildlife interests get in the way of progress. What is called for is the development of a series of demonstration projects that can provide the basis for a new partnership in resource management.

In interviewing project participants on the fish and wildlife potentials available, several points became clear. With the present 50 percent local cost sharing for enhancement (and the opportunity to finance the local share at interest,) there is a temptation to call it mitigation and finance the whole cost at zero interest. The point is that the technical distinction between mitigation and enhancement is often vague at best. Second, whether mitigation or enhancement, the features agreed to did not have the benefit of being a part of an overall wildlife management plan. The suspicion is great that if given the dollars involved the fish and wildlife managers would not have spent the money on the features in the SRPA project. But these were the ones that could be gotten through bargaining against the other proposed features at hand.

We were not able to discover a project where a fishery opportunity, for example, had suggested to someone that he approach local irrigation interests to see if they would like to join in a cooperative venture through SRPA. Yet some SRPA projects start with someone interested in flood control, municipal supply or hydropower. The reason for this is simple, fish and wildlife interests rarely have much financing capacity to bring to the bargaining table.

If the partnership is ever to move beyond one built on the tenius foundation of blackmail, some new arrangements must be found. One possibility is to develop some pioneering projects that feature fishery development, or redevelopment, in addition to irrigation. But this will not work unless the program recognizes the impecunious nature of the fish and wildlife sponsors to pay for their share of the planning, the structural features required and, perhaps most important, to compensate those whose water rights have to be diminished in favor of the fish and wildlife values.

Extending anadromous fisheries in Pacific Coastal streams is a good case in point. At the large project level, the Bureau of Reclamation and the Corps of Engineers have spent millions on fish related measures. Mitigation measures already extracted from the system only achieve part of the apparent potential. Under planning carried out by the Northwest Power planning council, many more dollars and considerably more water will be committed. However, at the small project level there are a number of opportunities for SRPA.

One example is a project now being considered by the Monterey Peninsula Water Management District and not yet involving the SRPA program. The Carmel River now runs when the steelheads do in February. Perhaps 1000 adults make the journey encountering two small dams. The potential according to state fishery biologists is some 3000 to 5000. The California American Water Company developed some of the river's potential and there is a need for more supply. While the existing and potential use by irrigation is limited, none is apt to be provided for under current plans. This steelhead run is the most southerly well recognized run on the coast. While even at full potential it will provide only limited fishing, the symbolic value of a healthy fishery in that stream and in that community is very great. Even if one could successfully tap the interest of fishermen for cost sharing, perhaps through a state agency, it is unlikely to be enough to make a dent in the costs. Traditional mitigation approaches may have more success in this community than most, but certainly irrigation interests would have little incentive to cover fishery costs considering the limited and declining use they may make of any water.

Recommendations for Unique Fish and Wildlife Projects

SRPA should establish a special review procedure, such as a panel of outside experts, to determine unique habitat development opportunities early in the planning process. Currently the bargaining that takes place is often triggered by the NEPA -EIS process and comes very late in the plan formulation process. A project sponsor could ask for such consideration before the full proposal is submitted. The attraction to do so should be the prospect of a grant to cover the habitat development part of the planning and project costs with the stipulation that any resources reasonably expected to be raised locally as a result of the habitat improvements be made available for a portion of the cost that could be so paid over the life of any other loans involved.

Indian Water Rights Development Under the SRPA

Water development in small manageable projects, designed for the development of farming and managerial skills, offer a way to break the welfare syndrome for some Indians in the west. Since the Winter's Doctrine was taken seriously, well after the 1908 decision, the search has proceeded for a workable format. The large project approach with a fast track development plan has not given the results hoped for, large projects provide the potential for large mistakes. Small projects properly supported may provide a better potential for individual growth and independence. Certainly the loan feature of SRPA provides a desirable discipline for the development and stability of a sponsoring organization.

In the Colorado Basin there are 28 million acres in 29 reservations with 300,000 acres leased for agricultural use, most to non-Indians. Further development is attractive as a means to protect their water rights and to produce income.

The Gila River Farms, an independent Indian nation enterprise, was the first Indian project approved by SRPA. Jack Palmer, the manager, said it was the only source of loan funds for land and water development that he could find. Many conventional sources of funding are not available to the Indians because of limitations with respect to immunities to suit, the extent of the trusteeship status, and the like, make attorneys for lenders very nervous. Such nervousness leads to higher interest rates, extra collateral, and many denials of credit. For long term debt, this is compounded. All knowledgeable persons contacted agreed that SRPA was still the only source of funds for developmental projects outside of the trust funds and internal tribal funds.

In the case of the Gila River Farms, they have progressed from a "catch as catch can" approach to financing to the point where on there second loan they were asked by OMB and agreed to qualify as a category I project, i.e., like virtually all non-Indian projects, they shortened the repayment period and/or found enough up-front non-Federal funding to hold the subsidy to 50 percent. Initially, a cotton gin, who in turn borrowed from the Bank of Cooperation, lent Gila River Farms operating capital so that they could start with already irrigable land. Now banks are willing to loan for such purposes. The tribe does some self financing and will do more. Half of the farm profits now go to the tribe and half into the leveling and ditch lining. The first SRPA project (1978) was used to rehabilitate a major part of the system, the second will put the Farms at 20,000 acres. Unsatisfactory work by contractors and advantages of labor use distribution have encouraged the Farms to do their own development work.

The Farms now hire between 100 to 150 Indians, 90 percent of the work force. Managers are responsible for 2500 to 4000 acres each depending upon complexity. Training and advancement of all workers is an important objective for the Farms. Workers are switched from task to task and supervisors are expected to be skilled in the tasks they supervise; managers, in all tasks. Managers share 10 percent of the profits. Two Indian employees have gone out to develop their own farms; one was successful. More are expected to do so, especially if product prices improve.

The Gila River Farms application process was easily one of the longest in the SRPA program history. From the notice of intent through the formulation, design, and construction for a SRPA project several years are usually consumed. Gila River started the process in 1969 and broke ground in 1978. In the meantime, many if not all, of the uncertainties for an Indian project have been resolved and they go through the process as fast as any other.

The potential for Indian projects is considerable. The Gila River Indians are in the process of developing a comprehensive land and water development plan, and certainly have the potential for a number of more projects. In 1978 it was estimated that 68,000 acres of the 266,000 acre potential is irrigated. After a considerable history of farming in the 1800, production on the reservations cam to an end when Anglo settlers upstream diverted the river.

The Ak-Chin are completing there second project and with that will reach their potential of 14,500 acres. They will share in a distribution system with two non-Indian districts under a complex federation arrangement.

The Papago have submitted a notice of intent and have further potential in the water claims of the main reservation and at San Xavier.

But the Navajo have some of the most exciting prospects. They are the largest reservation and tribe in the United States. They have put great hope in the Navajo dam project. It is said to have been scheduled to bring in 10,000 acres per year, all on grants, and to have actually achieved 40,000 acres in 12 years. Their national goal of self sufficiency maybe more effectively achieved through a series of smaller projects. As many as 70 of the 110 Navajo chapters may have viable small projects. Four in the 4,000 acre range are being considered currently, widely separated over the reservation that includes parts of three states.

The Many Farms project is a good example. With tribal resources and a bank loan secured by tribal deposits, the Many Farms Cooperative has begun farming 800 acres of land that could have been allocated by the land committee set up decades ago to provide small semi-subsistence farms. They expect to consolidate and operate 1,200 that were allocated in 20 to 40 acre units.

Like many Indian lands, development is expensive. Besides the usual leveling, ditch lining, pumps, and canals the soil needs to be mixed to a level of 5 feet to breakup sodium induced layers. While an old dam provides some water renovation is needed and beyond resources of the tribe strained by pressure for social services. A loan for further development, perhaps up to 4,000 to 5,000 acres, is seen as necessary both as the only way to achieve the development and as an important source of commitment and discipline in the operation of the cooperative. It was explained that with a pickup and food provided by the Navajo Nation and the Federal Government, and shelter relatively easy to put together, subsistence was not the issue. But with a sense of commitment to the local chapter of the tribe it was likely that the cooperative could succeed.

Skill and managerial development are a challenge however. It was felt that in many ways the Indians were where non-Indian farmers were, technologically, 30 years ago. Sub-management units with varying provision of central services are being considered as both a realistic organizational device and as a way to build skills and respectability. In addition to the vagaries of price and weather variable results due to their development period can be expected. All informants familiar with Indian projects agreed that a combination of modest training grants to cover critical on-the-job-training and a variable repayment arrangement were sensible changes, comparable to some of the proposals for depressed urban area enterprise zones. Likewise some technical assistance in district or mutual management would probably make the development process proceed more smoothly, and with less risk.

It should be noted that these provisions are needed by some non-Indian projects as well. Several were visited where the repayment schedule had been projected in most unrealistic terms. In hindsight it was clear that district revenues had not been designed to deal with the vagaries of price, weather, and/or managerial development.

Most associated with Indian projects were concerned over rumors circulating that interest may be added to irrigation development loans. The feeling was that this would be inequitable for Indian projects because given the delays in implementing the Winter's Doctrine of 1908 they had a special claim. Others had been given the chance to develop often with Indian water, and it was only fair they got the same treatment now.

Recommendations

Developmental grants up to 20 percent of the cost of irrigation should be authorized to provide for skill and managerial development in projects that face unusual challenges but are deemed to be viable in the long run. This should not be limited to Indian projects. Any change in the interest free policy for irrigation development should allow the Secretary to take into account equity considerations such as income and prior status with the Federal Government.

Concluding Remarks

I recognize that this preliminary report did not address all the issues imbedded in Federal involvement with irrigation. There are many both symbolic and substantive issues that concern many people that are beyond the scope of our study.

The issue of why any subsidy for agriculture at all is an example. Farming is inherently an industry that will drive the gains from resource development and technology into lower prices to the processor and shipper or into higher values for land. It has been worth it to society to subsidize these. But to sustain resource capacity to produce we must find ways to conserve these resources. The individual finds many conservation measures not profitable in the short run. All of this gets badly mixed up in the response to the inherent instability of prices and incomes in agriculture.

For example, reformers have for years voiced concern over the apparent inconsistency of government subsidizing resource development and new technology development, i.e., stimulating output, while at the same time spending millions to support prices for farm products in the hope of stabilizing incomes. This has led to proposals to require full cost reimbursement for irrigation used to grow surplus crops. If restricted to water used to irrigate new land such a proposal would provide symbolic recognition of this apparent inconsistency between short term and long term policy. If applied to already irrigated land this would seriously reduce the bargaining power of the SRPA program and community leaders to achieve desirable water resource management objectives. But it would not measurably affect the instability problem in American agriculture. The trade off between the costs of surplus management and costs of improved water management would probably be unsatisfactory if we could devise a way to estimate them. Even if the whole Bureau program were to pay full costs for water, after the shake out of land values changes, farm business and project refinancing and the like, the effect on Federal costs for price support would be temporary. Fine tuning between programs is difficult, often impossible, within a simple program it is hard enough.

Perhaps more to the point are some of the fine tuning suggestions above. Explicit objectives, regularly reviewed to insure adjustment to the times, with authority to match the objective, provide a base for holding public programs accountable for what they do and how they spend the taxpayers' money.

Senator MURKOWSKI. Thank you very much, Dr. Allee.

I apologize for having left the hearing process during your testimony, Mr. Boen, but we had a vote on, and it left me with no other choice.

Do you have any specific questions?

Mr. BROWN. I have a few that I'd like to ask, with your permission, Mr. Chairman.

Senator MURKOWSKI. Please proceed.

Mr. BROWN. Mr. Boen, you referenced H.R. 2025 of the House and your somewhat reluctant support of the provision of the legislation; isn't that correct?

Mr. BOEN. Yes.

Mr. BROWN. What were those provisions again?

Mr. BOEN. Well, in changing the interest rate formula from a formula that establishes a rate on the basis of a long-term average and replacing it with a current interest rate, it provides instability of knowing what the interest rate is going to be when you execute a contract. Because it's conceivable that the rate could change 1 week before you got the job done, in which case all your preliminary work, that would be the base for the repayment contract which had been agreed upon among the constituents would then change, and that was one of the reasons for securing the change back in mid-1960's.

Now, I don't think we anticipate that the interest rates were going to raise as fast as they did. The applicants received a benefit. At the present time the interest formula would soon have the reverse action because we had several high interest rates in 1980, 1981, 1982, and perhaps slightly before, and then in addition to that—in addition to that hump, so to speak, in the curve, each year you drop off an interest rate in the past that was lower and pick up a current. So I would be hopeful that any new interest rate reflecting current might have some opportunity to give some stability so you didn't get a change right at the crucial time.

The average would not—for example, theoretically, if you didn't have long-term changes, if it was up and down, the average then would, of course, protect the Federal Government in the same manner as it would the constituent. That was one.

The other is that we're reluctant to see a fixed minimum cost sharing—and I apologize for turning the cart before the horse a couple of times—on the function being that the greater cost sharing could permit a longer repayment and vice versa, and accomplish the same purpose and fit the financial structure at home. It would be much like having one fixed mortgage program for all home investments, regardless of your financial condition.

Mr. BROWN. Is there a recommended level in H.R. 2025?

Mr. BOEN. Yes. The recommended level there is 15 percent. That's contained in a section in that bill.

Mr. BROWN. Dr. Allee, in your analysis of the program do you have an opinion as to the impact that a level of 15 percent would have on potential projects, particularly Indian projects?

Dr. ALLEE. As far as projects in general are concerned, 15 percent would not be too great a strain. Most of them are now coming up with similar amounts to that in response to the administration's requirement for no more than a 50-percent subsidy. This may not be the place to go into the arcane way in which that subsidy is calculated.

Mr. BROWN. I have often wondered how they did that.

Dr. ALLEE. Well, I can walk you through the calculations. I think I've got it straight now.

Mr. BROWN. Later, I think.

Dr. ALLEE. Yes, sometime. But subsidies are in the eye of the beholder, and basically you have to come down to a definition of it in almost any case. As far as the Indians are concerned, some of the tribes are putting that kind of money into projects now. Others have no reasonable way in which they could probably raise even that amount. But it's not just Indians that are in that kind of situation. There are other non-Indian projects around the country where a decision has got to be made. You're either going to watch those projects go and go out of business and lose those farm businesses, lose the support for some small communities that are involved—in some of the cases not so small—or we're going to have to find a way to selectively perhaps deal with easing requirements like the loan factor, as that 50-percent rule is referred to, or the upfront requirements.

This I think is a tough policy question, and certainly the Bureau has been worrying about, and I think is in a position to effectively study it and come up with some recommendations.

Mr. BROWN. In your written statement you also examine the Farmers Home Administration's means test, and I admit I have not read your statement. I apologize for that. But do you also elaborate on the potential impact that a means test could have on a program such as the one under the Small Reclamation Projects Act?

Dr. ALLEE. No, I don't elaborate on that in any detail. I look forward, however, to—we're just now getting the data set up to where we can play with it.

Mr. BROWN. If you would care to submit that information to the committee when your analysis is complete, that would be appreciated. The chairman has indicated that the record would be open for 2 weeks. I'm sure that you would probably not be able to meet that deadline, but we would welcome the information at a later date, if at all possible.

Dr. ALLEE. I think we can get something together in that 2-week period.

Mr. BROWN. Thank you very much, Doctor.

Mr. Boen, both Mr. Osann and Mr. Broadbent in their statements recommended that the legislation be amended to address the production of surplus crops on projects that receive small reclamation loans.

Have you had the opportunity to discuss with the administration or with Mr. Broadbent or his representatives the amendment that they may propose?

Senator MURKOWSKI. Let me interrupt before you answer that. I'm going to have to excuse myself. I have another engagement at 5:30. So I would ask that you go on with the specific questions which you have and adjourn the hearing.

Mr. BROWN. Yes, sir.

Senator MURKOWSKI. I thank you individually and the other witnesses that have testified today. I think we have compiled a worth-while record, and I look forward to proceeding on your recommendations.

Thank you, gentlemen.

Mr. **Brown**. Mr. Boen.

Mr. **Boen**. No, Mr. Brown, I have not had the opportunity of discussing his recommendation in his statement, and as a matter of fact, I didn't see that in time to include it in my comments.

Mr. **Brown**. Well, Mr. Broadbent is going to submit recommended legislation or language dealing with surplus crops to the subcommittee, and I would hope to forward that to you and your committee for comment and your review.

I will also point out that we will be circulating that language to other interested parties as well, trying to find out if in fact a consensus could be achieved on the production of surplus crops. Mr. Broadbent's proposal offers the irrigation farmer a choice, if I recall correctly, between paying interest and being eligible for surplus crop assistance, or not paying interest and not producing surplus crops.

This could be a very harsh choice for some of the irrigation farmers located in the northern tier States, where soils and climates are not conducive to growing crops other than perhaps barley or other similar surplus crops. And also, there is a dilemma as to crops which are considered surplus but in fact are grown for on-farm consumption, and in fact do not enter into the marketplace but are consumed strictly on a local basis.

This is another difficult issue that I hope the members of the committee will be able to resolve.

I would like to thank all of you for appearing at this time. As the chairman noted, the record will be open for 2 weeks, and I would hope that all of you would take that opportunity to either revise your remarks, submit additional material or to comment on the testimony of others. We're not looking for an adversary situation, of course, but we do have differing views that have been presented to the committee on this legislation, and I think that the committee and members would benefit from any further analysis that you would care to undertake.

So, at the direction of the chairman, the hearing is adjourned.

[Whereupon, at 5:28 p.m., the hearing was adjourned.]

APPENDIX

ADDITIONAL MATERIAL SUBMITTED FOR THE RECORD

STATEMENT OF WILLIAM H. CLAGETT, ADMINISTRATOR OF THE WESTERN AREA POWER ADMINISTRATION, BEFORE THE SUBCOMMITTEE ON WATER AND POWER OF THE SENATE
COMMITTEE ON ENERGY AND NATURAL RESOURCES

July 16, 1985

Mr. Chairman, it is a pleasure to have this opportunity to submit this statement to your Subcommittee today, and to provide you with the views of the Western Area Power Administration (Western) on S. 1131, a bill "[t]o integrate the Hilltop and Gray Goose Irrigation Districts, South Dakota, into the Pick-Sloan Missouri Basin Program (PSMBP)." Western is a Federal power marketing agency, which markets power generated as part of the PSMBP.

The bill would authorize two operating non-Federal irrigation projects, the Hilltop and Gray Goose Irrigation Districts in South Dakota, as units of the PSMBP. The PSMBP is a Federal water development project whose primary purposes are flood control, irrigation, and the generation of hydroelectric power. The bill would require that the two non-Federal irrigation districts be integrated physically and financially with the PSMBP. PSMBP power would be made available to the two irrigation units on the same basis as it would ordinarily be made available to irrigation units constructed by Federal agencies as part of the PSMBP. Water users would be required to reimburse the suballocated PSMBP costs assigned to the two irrigation districts by the Secretary of the Interior and would receive pumping energy at the project rate of 2.5 mills per kilowatthour.

The concept of integrating operating non-Federal irrigation projects into a Federal multipurpose water development project is a new one. The bill leaves some important questions unanswered, so we are unable to accurately assess the impact the bill would have on Western's operations. However, it appears that it could affect power customers in two ways: it could increase their power rates and reduce their present allocations to PSMBP power.

The precise effect on the PSMBP power rates cannot be determined by Western at this time because the bill does not specify how the irrigation districts are to be financially integrated into the PSMBP. It does not, for example, indicate whether the PSMBP will assume responsibility for the debt obligations of the two districts on the same terms that they are presently being repaid, whether the United States will cancel the existing debt obligations to a Federal agency, or whether the United States will purchase the facilities of the irrigation districts and repay the Federal investment over a fifty year period. Until Western knows what the additional costs are and how the financial integration would be accomplished, we cannot estimate the effect on the power rates.

The precise effect on the present entitlements to PSMBP power customers cannot be measured either. It is our interpretation that the bill would require Western to furnish the two irrigation districts only with the amount of power needed to meet their main gravity lifting requirements at the PSMBP project pumping rate of 2.5 mills per kilowatthour. Western would not be required to supply PSMBP pumping power for pressurized (on-farm) pumping, at the PSMBP (Eastern Division) composite firm power rate, which is presently 7.14 mills per kilowatthour.

Western recommends that before further action on S. 1131 occurs, the questions about (1) how the irrigation districts should be financially integrated into the PSMBP; and (2) whether Western is to furnish only PSMBP power required for main gravity lifting, at the PSMBP project pumping rate, should be addressed either through clarifying amendments or through an explanation in a Committee report. Western would be glad to work with the Committee on these matters.

Enactment of S. 1131 would not appear to have a significant impact on the budgetary resources of Western, but an accurate assessment cannot be made at this time.

I appreciate the opportunity to comment on S. 1131, and am prepared to provide any additional information that may be necessary.

BYRON-BETHANY IRRIGATION DISTRICT

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REGULAR MEETING HELD ON SECOND TUESDAY OF EACH MONTH

85 JUL 15 PM 12:51

July 9, 1985

Senator Frank H. Murkowski
Chairman of the Sub-Committee on Water and Power
Committee on Energy and Natural Resources
Hart Senate Office Building, Room 212
Washington D.C. 20510

RE: S-1171

We urge your committee to give your consideration to favoring passage of Senate Bill S-1171 which would extend the authorization ceiling of the Small Reclamation Projects Act of 1956.

The Small Reclamation Projects Program has had the support of Congress for more than 25 years and is an excellent part of Reclamation. The loans are paid back 100 percent and the money is used for facilities that result in continuing production of food and fiber and the creation of permanent jobs.

As recipients of a Small Reclamation Projects Act loan in the past, we realize the importance of this funding, and we would appreciate your support of this legislation.

Sincerely,
BYRON-BETHANY IRRIGATION DISTRICT

Lois Stornetta

Lois Stornetta, Secretary

cc: Senator Alan Cranston
Senator Pete Wilson
Senator James A. McClure

STATE OF CALIFORNIA—RESOURCES AGENCY
GEORGE DEUKMEJIAN, *Governor*

DEPARTMENT OF WATER RESOURCES
CALIFORNIA WATER COMMISSION
SACRAMENTO

Address All Communications to:
The Chairman of the Commission
P. O. Box 388
Sacramento 95802
Phone: (916) 445-8750

July 11, 1985

Honorable Frank H. Murkowski, Chairman
United States Senate Committee
  on Energy and Natural Resources
Subcommittee on Water and Power
Washington, DC 20510

Dear Senator Murkowski:

The California Water Commission, an official agency of the State of California, functions in an advisory capacity to the Department of Water Resources. It consists of nine members, all appointed by the Governor. Its membership is drawn from all sections of the State and includes representatives of the professions, agriculture, business, and industry, all having a background and interest in local water problems.

I am pleased to provide written comments on S. 1171, a bill to amend the Small Reclamation Projects Act of 1956, as amended, and S. 1192, a bill to implement the Coordinated Operations Agreement.

Federal-State Coordinated Operations Agreement

Finalizing the Coordinated Operations Agreement for the Federal Central Valley Project (CVP) and the State Water Project (SWP) is significant and important to both Federal and State interests.

The water of one project is physically indistinguishable from that of the other when mingled in the lower portion of the Sacramento River and Sacramento-San Joaquin Delta. Coordination of CVP and SWP operations is necessary to attain the most effective use of available water resources and to assure that each project obtains its appropriate share of available water while bearing its appropriate share of obligations to protect the environment of the Delta.

The California Department of Water Resources (Department) and the U. S. Bureau of Reclamation (Bureau) have operated their respective projects pursuant to a Coordinated Operations Agreement signed May 16, 1960, since the State Water

Project became operational. Negotiations of operating criteria started in 1961 and resulted in a draft agreement dated May 13, 1971. This draft was superseded by another draft agreement dated December 22, 1982. In that agreement, the State and Federal Governments agree to meet most water quality standards specified in Decision 1485 of the California State Water Resources Control Board (SWRCB).

The negotiations were reopened in 1984 to discuss a few particular concerns including how coordinated operation of the projects would be affected if new and more stringent standards are developed by SWRCB. The parties reached a settlement which is reflected in a draft agreement dated May 30, 1985. The California Water Commission feels it is time to lay this issue to rest and move ahead to other more pressing problems. The moratorium on new water service contracts for the CVP needs to be lifted, and the State must move forward on programs to meet increasing water needs. It is important to note that the Bureau has been meeting the delta standards of the SWRCB for many years through a series of one year agreements.

The Commission supports Congressional authorization of the Coordinated Operations Agreement.

Small Reclamation Projects Loan Program

Increasing the authorization ceiling for the PL 984 Small Reclamation Projects Loan program from $600 million to $1.2 billion is essential to keep in place this program vitally important to locally initiated water development. On March 28, we recommended the Congress appropriate funds for F.Y. 85-86 for several projects from Colusa County Water District in the north to Rancho California Water District in the south. There are several applications in the pipeline which exceed the current authorization. We are supporting continuation of this popular and successful program.

I am pleased to offer our wholehearted support for S. 1171 and S. 1192, and request favorable action by the Subcommittee.

Please be advised, I will not be able to appear in person at the July 16 hearing in Washington. I respectfully request that this letter be made a part of the record of that hearing.

Sincerely,

Daniel M Dooley

Daniel M. Dooley
Chair

CASITAS Municipal Water District
serving and conserving

Site of the 1984 Olympic
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Chief Engineer

JAMES D. LOEBL
Attorney

ORVILLE LEE HORN
Auditor

July 11, 1985

Hon. Frank H. Murkowski
Chairman Subcommittee on Water and Power
Senate Committee on Energy and Natural Resources
Hart Senate Office Building, Room 212
Washington, DC 20510

Dear Mr. Chairman:

At its regular meeting held July 10, 1985, the Casitas Board of Directors discussed SB 1171 which would appropriate monies for expenditures under the provisions of Public Law 984. It was the Board's understanding that appropriations previously authorized by the Congress are nearly depleted.

The Casitas Board is very concerned that funding will continue to be available for qualified water development and distribution projects within the requirements of Public Law 984. During calendar year 1984, for example, the amount of water required and delivered within the Casitas service area exceeded the safe yield of the federally funded Ventura River Project by 10 percent. Projections of future demands indicate that this deficiency will carry on into the future. Additional water development projects will be required if suffucient supplies continue to be available within the Casitas service area.

Since nearly 40 percent of the water delivered by Casitas is utilized in commercial agricultural production, any future project developed by Casitas should be qualified under the provisions of Public Law 984. Furthermore, several tax-limiting propositions adopted by the voters of the State of California over the past several years have eliminated general obligation bond financing. Obtaining financing under the provisions of Public Law 984, therefore, has become even more critical and desirable to agencies which qualify than before. It is estimated that the approximate

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capital costs to be incurred by Casitas to meet water demands within its service area for the next 15-25 years will approach fifty million dollars.

Your favorable consideration of this proposed legislation will be sincerely appreciated by the entire Board of Directors of Casitas Municipal Water District.

Sincerely,

ROBERT N. McKINNEY
GENERAL MANAGER AND CHIEF ENGINEER

Copy to: Hon. James A. McClure
Chairman Senate Committee on
Energy and Natural Resources
Dirksen Senate Office Building
Washington, DC 20510

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July 10, 1985

Senator Frank H. Murkowski
Chairman of the Sub-Committee on Water and Power
Committee on Energy and Natural Resources
Hart Senate Office Building Room 212
Washington, D.C. 20510

Dear Senator Murkowski:

The Small Reclamation Projects Act of 1956 has been an integral part of water development for small water districts for many years. The Elsinore Valley Municipal Water District strongly urges your support of S.1171 (Amendment to the Small Reclamation Projects Act of 1956).

In addition, the Elsinore Valley Municipal Water District wishes to thank you for your past and continued support of all water projects.

Sincerely,

ELSINORE VALLEY MUNICIPAL WATER DISTRICT

D. J. Laughlin
General Manager

DJL:jks

cc: Senator James A. McClure
Senator Alan Cranston
Senator Pete Wilson
Doyle F. Boen, Chairman, Small Projects Committee

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Representing [illegible]

Idaho Water Users Association, Inc.

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GREG PANTER
Associate Member

July 12, 1985

Senator Frank H. Murkowski
Chairman of the Sub-Committee on Water and Power
Committee on Energy and Natural Resources
Hart Senate Office Building, Room 212
Washington, D. C. 20510

Dear Senator Murkowski:

The Idaho Water Users Association represents the owners or operators of more than 2 million acres of irrigated land in the State of Idaho. Over half of the land represented is included within reclamation projects. Many of the irrigated acres in Idaho are the beneficiaries of the Small Reclamation Project Act of 1956. The Act has served western water resource entities well for over 28 years and many projects are still in the process of being completed or have been approved but not yet in construction. Additionally, there are some 40 additional projects in various stages of development preliminary to approval. The sponsoring agencies of these projects have already incurred substantial costs and years of planning and organizational efforts are involved. In order to fund these projects, HR-2025 and S-1171 must be passed. Without these two pieces of legislation, we will be unable to fund these vital water projects. It is important that you realize that all loan funds under the Small Reclamation Projects Act are fully repaid. Except for irrigation benefits, interest is paid on all loan funds and 15 to 25 percent of the loan is front end cost sharing. Unless the funding ceiling is raised by Congress, local agencies cannot continue to risk the expenditures for planning and preliminary engineering as up front costs. Our Association urges that you do everything possible to pass these two bills.

Sincerely yours,

Sherl L. Chapman

Sherl L. Chapman
Executive Director

SLC:kje
cc:Senator James McClure
Senator Steve Symms

OREGON **WATER RESOURCES** *CONGRESS*
P.O. Box 5871 • Bend, OR 97708
(503) 388-2080

Promoting the development, control, conservation, preservation and utilization of land and water resources of the State of Oregon since 1912

July 9, 1985

Senator Frank Murkowski, Chairman
Subcommittee on Water and Power
Committee on Energy and Natural Resources
Hart Senate Building, Room #212
Washington, D.C. 20510

Dear Senator Murkowski:

The Oregon Water Resources Congress is a non-profit organization representing irrigation districts, individual farmers, associated industry, and other organizations promoting the conservation of water resources through development which is technically, economically and environmentally sound. Our organization was formed under Oregon law in 1912.

A number of the irrigation district members have had the opportunity to take part in the Small Reclamation Project Act Loan Program (LP 84-984) over the years. This program has provided the opportunity for system improvements which have aided the individual farmers in those districts.

Without the program many of the improved facilities which have provided water conservation to the districts and their farmers, and ultimately to the public, would not have been developed. A number of the developments have included multi-purpose projects, providing benefits to recreators and other users at no direct cost to those supplemental benefactors.

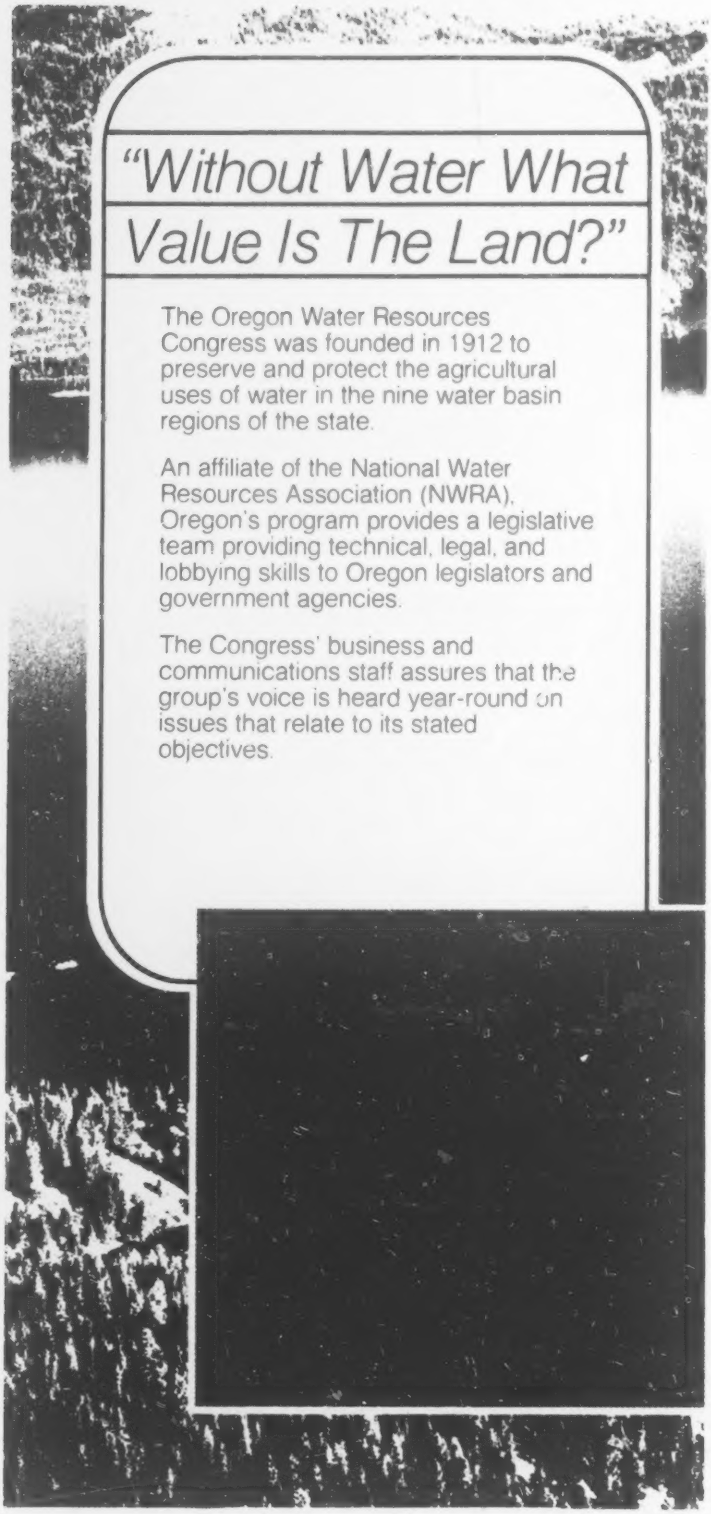
Please support continuing the Small Reclamation Project Act Loan Program during the hearings process next week for S.B. 1171.

Sincerely,

Jan Boettcher
Executive Secretary

OREGON WATER RESOURCES CONGRESS

Preserving and
Managing Oregon's
Agricultural Water
Resources

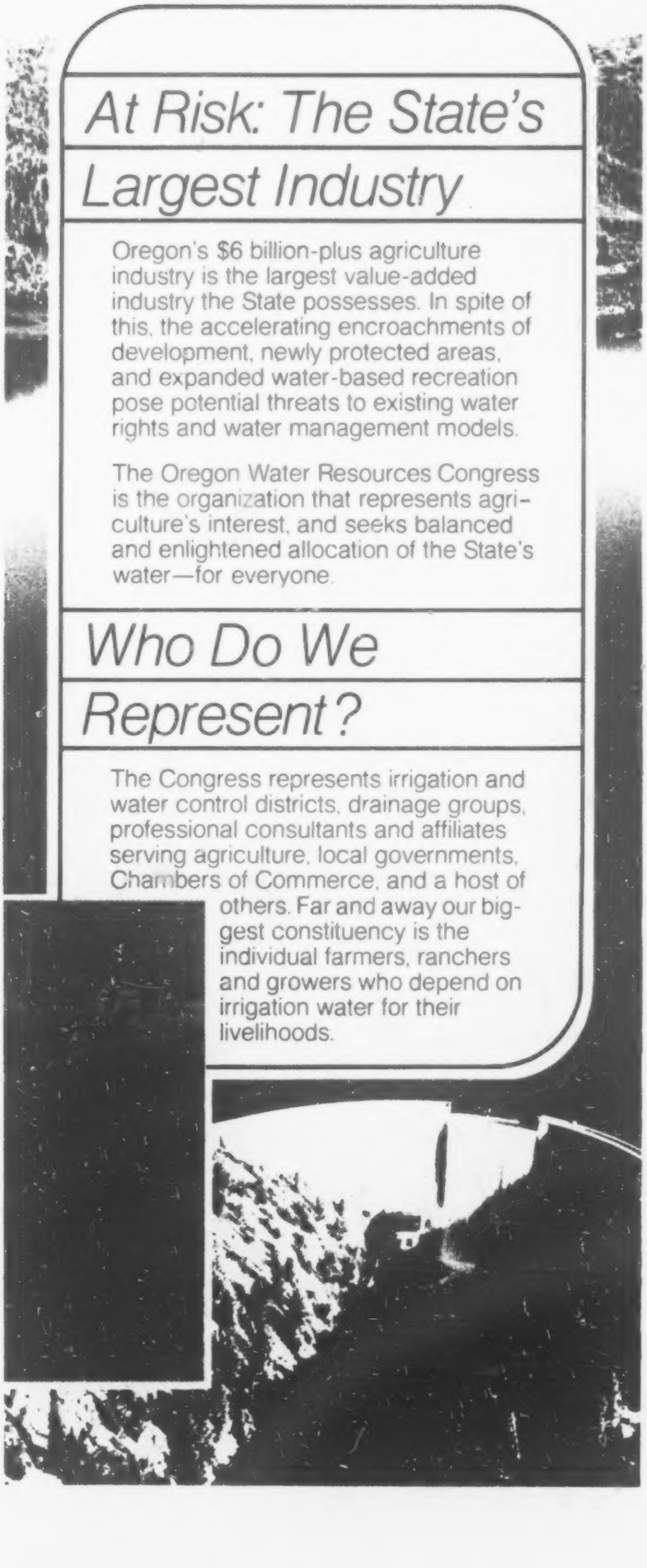


"Without Water What Value Is The Land?"

The Oregon Water Resources Congress was founded in 1912 to preserve and protect the agricultural uses of water in the nine water basin regions of the state.

An affiliate of the National Water Resources Association (NWRA), Oregon's program provides a legislative team providing technical, legal, and lobbying skills to Oregon legislators and government agencies.

The Congress' business and communications staff assures that the group's voice is heard year-round on issues that relate to its stated objectives.



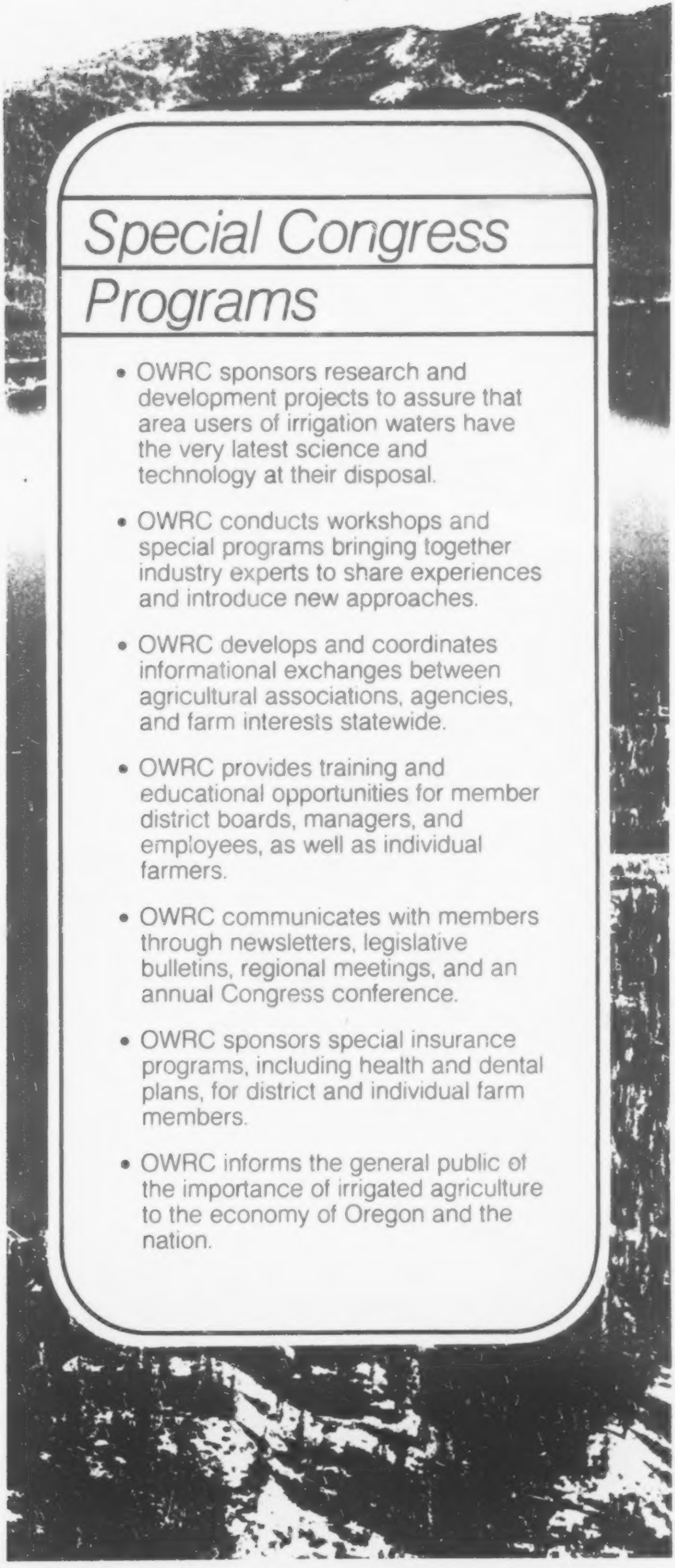
At Risk: The State's Largest Industry

Oregon's $6 billion-plus agriculture industry is the largest value-added industry the State possesses. In spite of this, the accelerating encroachments of development, newly protected areas, and expanded water-based recreation pose potential threats to existing water rights and water management models.

The Oregon Water Resources Congress is the organization that represents agriculture's interest, and seeks balanced and enlightened allocation of the State's water—for everyone.

Who Do We Represent?

The Congress represents irrigation and water control districts, drainage groups, professional consultants and affiliates serving agriculture, local governments, Chambers of Commerce, and a host of others. Far and away our biggest constituency is the individual farmers, ranchers and growers who depend on irrigation water for their livelihoods.



Special Congress Programs

- OWRC sponsors research and development projects to assure that area users of irrigation waters have the very latest science and technology at their disposal.
- OWRC conducts workshops and special programs bringing together industry experts to share experiences and introduce new approaches.
- OWRC develops and coordinates informational exchanges between agricultural associations, agencies, and farm interests statewide.
- OWRC provides training and educational opportunities for member district boards, managers, and employees, as well as individual farmers.
- OWRC communicates with members through newsletters, legislative bulletins, regional meetings, and an annual Congress conference.
- OWRC sponsors special insurance programs, including health and dental plans, for district and individual farm members.
- OWRC informs the general public of the importance of irrigated agriculture to the economy of Oregon and the nation.

For More Information . . .

Call or write the

OREGON
WATER RESOURCES
CONGRESS

P.O. Box 5871
Bend, OR 97708
Telephone: 503/388-2080

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6767 EAST MAIN STREET P.O. BOX 5157 STOCKTON, CA 95205-0157 209/948-0333

July 11, 1985

Senator Frank H. Murkowski
Chairman of the Sub-Committee on
Water and Power
Committee on Energy and Natural Resources
Hart Senate Office Building, Room 212
Washington, D.C. 20510

Subject: S. 1171

Dear Senator Murkowski:

I am writing on behalf of the Board of Directors of Stockton East Water District (SEWD) to state support for S.1171 (to amend the Small Reclamation Project Act of 1956), and to urge enactment at the earliest possible time.

SEWD provides water for a 200 square mile area of Central California suffering from a critically overdrafted groundwater basin. Supplemental water is available, but a $40 million conveyance system must be constructed. Although the urban Stockton area is within the District, the majority of the service area is agricultural. The conveyance project is financially feasible only if a Small Reclamation Act Loan can be obtained. And of course, no such loans will be possible unless S.1171 is enacted.

Very truly yours,

EDWARD M. STEFFANI
General Manager

EMS/hc
cc: Senator Alan Cranston
Senator Pete Wilson
Senator James A. McClure
Mr. Doyle F. Boen, NWRA

W BILL ROBERTS AND REID ROBERTS
311 EAST MAIN SUITE 203
STOCKTON CA 95202 15AM

Western Union Mailgram

4-0417295196 07/15/85 ICS IPMRNCZ CSP WHSB
2099418714 MGMB TDRN STOCKTON CA 64 07-15 0409P EST

SENATOR FRANK MURKOWSKI
CHAIRMAN OF THE SUBCOMMITTEE ON WATER AND
POWER
COMMITTEE ON ENERGY AND NATURAL RESOURCES
HART SENATE OFFICE BLDG ROOM 212
WASHINGTON DC 20510

THE DISTRICT URGES YOUR SUPPORT OF S.1171. PASSAGE OF THE "SMALL PROJECTS BILL" WILL ALLOW NECESSARY LOANS FOR VITAL WATER PROJECTS NEEDED TO SUSTAIN EXISTING AGRICULTURAL AND MUNICIPAL ECONOMIES.

REID ROBERTS
SECRETARY
CENTRAL SAN JOAQUIN WATER CONSERVATION DISTRICT

16:11 EST

MGMCOMP

SAN LUIS AND DELTA-MENDOTA WAT
PO BOX 2135
LOS BANOS CA 93635 12AM

Western Union Mailgram

4-0454648193 07/12/85 ICS IPMRNCZ CSP WHSB
2098264043 MGMB TDRN LOS BANOS CA 217 07-12 0506P EST

HONORABLE FRANK H MURKOWSKI
CHAIRMAN OF SUBCOMMITTEE ON WATER AND POWER
COMMITTEE ON ENERGY AND NATURAL RESOURCES
HART SENATE BLDG OFFICE RM 212
WASHINGTON DC 20510

IT IS OUR UNDERSTANDING THAT A HEARING ON SENATE BILL 1171 WILL BE HELD BY YOUR COMMITTEE ON JULY 16 1985, THE SMALL RECLAMATIONS PROJECTS ACT PROGRAM. WE URGE YOUR SUPPORT OF THIS BILL AND WE FURTHER URGE THAT YOU DO WHATEVER POSSIBLE TO MOVE THE BILL THROUGH YOUR COMMITTEE AND THE FLOOR OF THE SENATE AT THE EARLIEST POSSIBLE DATE. THIS LEGISLATION WILL PROVIDE ADDITIONAL FUNDS FOR A LOAN PROGRAM WHICH IS FULLY REPAID TO THE UNITED STATES, EXCEPT FOR IRRIGATION BENEFITS INTEREST IS ALSO PAID ON THE LOAN FUNDS BY THE VARIOUS DISTRICTS. THE LEGISLATION REQUIRES 15 PERCENT TO 25 PERCENT UP FRONT COST SHARING. OUR ASSOCIATION REPRESENTING 36 IRRIGATION AND WATER DISTRICTS ON THE WESTERN SIDE OF THE SAN JOAQUIN VALLEY IN CALIFORNIA COMPRISES OVER 1,200,000 ACRES OF AGRICULTURE. SEVERAL OF THE DISTRICTS WITHIN OUR AREA HAVE UTILIZED THIS PROGRAM. THE SILVER CREEK DRAINAGE DISTRICT WITHIN OUR ASSOCIATION AREA WILL BE APPLYING FOR FUNDS UNDER THIS PROGRAM--A PROJECT THAT WILL PROVIDE FLOOD CONTROL FOR THE CITY OF MENDOTA CALIFORNIA. AGAIN WE URGE YOUR SUPPORT OF SENATE BILL 1171.

SAN LUIS AND DELTA-MENDOTA WATER USERS ASSN
CECIL CAREY, SECRETARY

17:07 EST

MGMCOMP

5241 (R 7/82)

TO REPLY BY MAILGRAM MESSAGE, SEE REVERSE SIDE FOR WESTERN UNION'S TOLL - FREE PHONE NUMBERS

STATEMENT OF THE
CALIFORNIA DEPARTMENT OF WATER RESOURCES ON S. 1192
BEFORE THE

U.S. SENATE
COMMITTEE ON ENERGY AND NATURAL RESOURCES
SUBCOMMITTEE ON WATER AND POWER
HONORABLE FRANK H. MURKOWSKI, CHAIRMAN

BY

DAVID N. KENNEDY
DIRECTOR
DEPARTMENT OF WATER RESOURCES

Mr. Chairman, members of the Committee, I would like to begin my testimony by thanking you for the interest you have shown in the Coordinated Operation Agreement and giving us the opportunity to comment on S. 1192.

Before I get into the agreement itself, I believe a little history might be helpful. The Department of Water Resources and the Bureau of Reclamation have operated their respective projects pursuant to a coordinated operations agreement since the first unit of the State Water Project, the South Bay Aqueduct, became operational in 1962. The agreement that is currently in effect was signed May 16, 1960. That agreement was designed (1) to provide a method of allocating shortages in water supplies by prorating the shortage on the basis of specified annual diversion amounts; (2) to resolve the protest of each party to the applications of the other for water rights consistent with these annual diversion amounts and (3) to clear the way for construction of San Luis Reservoir and related facilities.

While the May 16, 1960 agreement provided the basis for coordinated operations, it recognized in Article 16 that further agreement on additional and more specific criteria would be needed for actually operating the two projects on a truly coordinated basis.

Negotiation of operating criteria started in 1961, and continued through May 13, 1971, when a draft agreement was completed. That draft agreement was never executed because of a stipulated judgment obtained in the lawsuit filed by the Environmental Defense Fund which prohibited approval of the agreement until an environmental

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Presented June 16, 1985, in Washington, D.C.

impact statement had been prepared. However, the 1971 draft did provide an operating procedure for use by the operators of the CVP and SWP to determine proportionally how much water each project must supply from its reservoirs for uses in the Sacramento Valley, including the Delta, and how much water each project is entitled to export from the Delta. Through 1982, with the exception of 1976, the Department and Bureau operated the projects in a coordinated manner based on annual letters of agreement which essentially followed the terms of the 1971 agreement.

Experience in operating and developing both projects particularly during the 76-77 drought, has shown that actual conditions are significantly different from what was assumed during the negotiations of the May 13, 1971, draft agreement. That agreement was negotiated using the November 19, 1965, Agreement on Delta Water Quality, which assumed a minimum outflow of about 1800 cfs from the Delta to San Francisco Bay. We now know higher minimum outflows are required. (Exhibit B of 1971 shows 2,911,000 acre feet per year for Delta area and outflow - Exhibit B-2 of 1985 shows 4,918,000 acre feet). In 1971, additional facilities were also assumed to be constructed such as a 2 million acre feet Auburn Reservoir, the Peripheral Canal and the Eastside Project of the CVP. Consequently, in 1979 negotiating teams of each agency were established to reevaluate the operating criteria, determine the proportionate water supplies available for each project, and develop a revised operations agreement.

The negotiators initially considered using a procedure based upon the priority of water rights as modified by the 1960 agreement. However, such a procedure was quickly discarded as impractical. Instead, an equitable sharing of water supplies available to the projects was accomplished by a negotiated step-by-step procedure. This procedure met most CVP requirements before utilizing assumed water supplies for the SWP. It was not a determination as to the priority of the water rights between the two projects, but merely a useful mechanism for carrying out practical operations studies. Dams and pumping plants of the Federal CVP were given the first opportunity to use the available water supply and also the first responsibility to meet in-basin needs and assure Delta water quality in compliance with standards (Exhibit A of the Agreement) extracted from the State Water Resources Control Board Decision 1485.

The first study included operation of the existing CVP system, excluding the San Luis Unit, and included all instream prior rights and environmental requirements.

The second study added the SWP system and the federal San Luis Unit. The water supply available for this study was the excess Delta outflow from Study No. 1 and was shared 50/50 between the CVP and the SWP. This sharing was developed through negotiations.

The results of these two studies are shown in Exhibit B of the Coordinated Operation Agreement. These two studies were prepared at both the current level of development and at the assumed "full" level of development (year 2020).

The results of Study No. 2 for the current (1980) level of development were used to design a sharing formula. The resulting sharing formula provided for CVP/SWP proportionate split of 75/25 responsibility for meeting in-basin use from stored water releases and 55/45 for capture of excess flow. The formula was arrived at by reasoning, trial and error, and negotiation.

I would like to emphasize that the essence of the coordinated operations is the sharing formula, not the water supply figures in Exhibit B-1. The projects are not to be operated to meet predetermined yields but rather to first meet the needs in the areas of origin including the Delta water quality standards and flow requirements contained in Exhibit A; only then is water exported from the Delta. The COA does not affect the rights of third parties (Article 18).

After 25 formal negotiating sessions and innumerable meetings of subcommittees, agreement was once again reached by the negotiating teams in December 1982. Following changes in the management at the Department and Regional Office of the Bureau, negotiations were resumed in 1984 and eight formal sessions were held to address areas of concern, primarily in Articles 10 and 11. I will discuss these in some detail. All formal negotiating sessions were open and attended by representatives from various segments of the public. Agreement was reached by the negotiating teams at the May 6, 1985, meeting and is set forth in the attached draft dated May 20, 1985 (please note that this date, not May 8, 1985, should be the one used in S. 1192).

The basic points included in the agreement are:

1. Both parties agree to meet a specified set of water quality standards (Exhibit A) from State Water Resources Control Board Decision 1485. Article 11 also requires that Exhibit A shall be amended to include any new Delta standards that are not inconsistent with Congressional directives. However, if the Secretary of the Interior determines that new standards are inconsistent with Congressional directives, the Secretary is promptly to request the Department of Justice to bring an action to determine the applicability of the new Delta standards to the United States.

This has been the most difficult area of the agreement. During the long negotiations we have come to realize that there is no other way to deal with possible changes in the water quality standards than to leave it up to the courts under existing law. In 1978 the U. S. Supreme Court ruled in California v. U.S. that the State Water Resources Control Board may impose conditions on the Central Valley Project that are not inconsistent with Congressional directives respecting the project. We have therefore constructed the agreement to be neutral on this legal issue. The disclaimer paragraph in Article 11(d) is designed to assure this neutrality.

The standards do not presently include permanent Suisun Marsh criteria, but the Coordinated Operations Agreement does contain a methodology (Articles 11 and 14) for incorporation of the Suisun Marsh protection features when current negotiations are completed. The Department has constructed, with financial assistance from the Bureau, the first stage facilities to meet Suisun Marsh water quality needs. The extent and timing of additional necessary facilities are subject to on-going negotiations between the Department, Bureau of Reclamation, California Department of Fish and Game and the Suisun Marsh Conservation District. The parties are nearing agreement. Congressional authorization and funding will be necessary for Federal participation. The State Water Resources Control Board will be requested to modify the Suisun Marsh standards in accordance with such agreement.

2. Each project's annual supplies at the 1980 level of development have been established, 6.9 million acre feet (MAF) for the CVP and 3.6 MAF for the SWP (includes 1.0 MAF for Feather River service area). Annual supplies at the 2020 level of development would be 8.4 MAF for the CVP and 3.1 MAF for the SWP (includes 1.0 MAF for the Feather River service area). The determination of these supplies was computed as described earlier.

3. The agreement provides for each party's use of the other's facilities for both short and long-term situations. In accordance with the requirements of State Water Resources Control Board Decision 1485, it provides for conveyance of Central Valley Project water through the California Aqueduct to San Luis Reservoir to make up for the curtailment of pumping during the striped bass spawning period.

Section 10(h) calls for a contract to be concluded by December 31, 1988, for the purchase of interim CVP water by the SWP and the conveyance of CVP water to federal contractors through the State Aqueduct. The Central Valley Project will have priority equal to that of the State Water Contractors for use of the State Aqueduct for an amount of water equal to the amount purchased by the State from the CVP. In addition, we are committed to providing conveyance service to the CVP for additional CVP water so long as such conveyance does not diminish deliveries or increase costs of water supplies to the State Water Project contractors. If we fail to reach agreement on such a purchase and conveyance agreement, then this coordinated operating agreement may be terminated by either party. (Article 14(b))

Finally the agreement calls for periodic review to determine the success of each party toward meeting its objectives and to make adjustment if necessary to enable the party to develop its respective water supplies. (Article 14)

The Agreement fairly protects the interests of both projects while meeting responsibilities to protect the water-related environment. We strongly urge prompt action by the Congress to allow execution of the Agreement as soon as possible after completion of environmental documentation this fall.